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THE NATIONAL GEOGRAPHIC MAGAZINE

France's Past Lives in Languedoc

By WALTER MEAYERS EDWARDS

With Illustrations from Photographs by the Author

THE SKY was black. Suddenly the fury of a summer rainstorm broke on us as we drove into Vichy. Wind-driven water beat into the car and dripped on our feet. To proceed was impossible.

Through blinding rain we drove up to a garage, but a man peering through the wide double doors waved us away. Sticking my head out into the deluge, I spluttered at him in my rusty French. With an eloquent Gallic shrug, he let us in.

The joke was on us. It was an undertaker's garage. Elaborately decorated black coaches and somber-garbed but grinning attendants surrounded us. One of the men apologized on behalf of his city for the moist reception. Then he added facetiously, "Vichy, remember, is famous for its waters."

My wife Mary and I were headed for the sprawling province of Languedoc, which stretches from the Velay region almost to Perpignan, and from the River Rhône westward to Toulouse, its ancient capital. In the next five weeks we drove 5,000 miles through castle-crowned Languedoc (map, page 5).

Land of the "Language of Yes"

The strange name comes from the old language of *oc*, or *langue d'oc*, a corruption of Latin by the inhabitants of southern Gaul. Dialects of it are still spoken in the south. The language of the north, also derived from Latin, became today's French. Dante is said to have first made the distinction between them by contrasting their words for yes—*oc* in one, *oil* or later *oui* in the other.

A patchwork of fertile fields undulated to the horizon as we entered this land of the "Language of Yes." Toward evening, about 80 miles south of Vichy, we stopped at the edge of a large bowl-shaped depression. A shaft of sunlight shining through the lingering overcast bathed in dramatic limelight the crumbling but majestic Castle of Polignac. A red-roofed village clustered around the platform of volcanic rock on which stood the square keep (pages 12-13).

This symbol of ancient feudalism was the first of many we were to see. It spoke of a country often torn by strife, where a common man's life was valued little and rulers small or great depended for security on massive walls and the strong arms of their serfs. Not many went to sleep at night without first looking under the bed.

An Unbelievable Landscape

The sight we saw a few minutes later as we drove southeast from Polignac to Le Puy was almost unbelievable. A giant conical rock projected almost 300 feet into the air, and crowning it was an exquisite little chapel, blending so perfectly with its base it seemed to grow there. We knew this must be St. Michel d'Aiguilhe (page 9).

By what magic did those builders of old erect such a masterpiece in so inaccessible a spot? It has stood, exposed to wind and storm, pointing a symbolic finger heavenward for almost ten centuries.

Beyond appeared still other wonders. A fine Romanesque cathedral stood upon a hilltop, with buildings of a medieval town spilling down all around. Behind it, on a rocky platform, the highest projection of all, stood a heroic statue of the Virgin (page 10).

No wonder Elizabeth Pennell, in her book *French Cathedrals*, called Le Puy "the most

Compagnie Aérienne Française

Twenty Thousand Frenchmen Pack the Ancient Amphitheater in Nîmes to See a Bullfight

This Roman arena, about 20th in size among 70 surviving, is one of the best preserved. In places the mortarless masonry is 105 feet thick. Thirty-four tiers of seats rise in four sections originally set aside for nobles, knights, plebeians, and slaves. Visigoths made the ring a fortress, adding towers and moats. Squatters of a much later era turned it into a tenement. Twenty feet of rubbish covered the ring when restorations began in 1813. Here the author saw a spectacular performance of Shakespeare's *Julius Caesar* in French.

picturesque place in the world . . . every feature in it sharply defined . . . well balanced and carefully composed, the whole effect artificial, theatrical, impossible."

Setting out next morning on foot to explore Le Puy, we were startled to see four men running directly toward us, shouting and waving sticks. Simultaneously a lady, seated at a café table on the sidewalk, screamed and leaped backward, spilling her coffee and upsetting her chair. A grunting pig darted from under the tables, barely missed Mary, and with a neat maneuver reversed his field. After a lively chase, the men caught up with the errant porker and maneuvered it squealing into a truck by its tail and one ear (page 7).

When Old Friends Meet

Crossing a wide modern boulevard lined with sidewalk cafés, we dodged two nuns on bicycles with robes billowing out behind them. Flags and banners fluttered in the old part of town in honor of the local holy week.

In a narrow street of shops we paused to buy cherries from a buoyant, gesticulating shopkeeper clattering about in wooden clogs. One place assailed our nostrils; it sold nothing but cheese.

A little comedy was enacted when two old men suddenly came face to face. Apparently they had not met for years. They embraced fondly, kissed each other on both cheeks, pulled each other's ears, spanked each other, then shook hands for half a minute, oblivious of bystanders who paused to smile.

A crowd was gathering before an altar set up at the far side of the sloping Place du Martouret. Our guide, small, blond Madame Marguerite Crespy, led us up a wide flight of stairs in the Hôtel de Ville, or City Hall. Here she produced a huge key that admitted us into the impressive council chamber.

Against the wall we saw a copy of the original flag of the United States. It had been given to Le Puy on June 14, 1918, by the Washington Campground Association of Bound Brook, New Jersey. The presentation was in memory of Lafayette, whose birthplace, the Château of Chavaniac, is less than 20 miles away.

Nîmes's Roman Temple Inspired Thomas Jefferson's Design of the Virginia State Capitol

Rome's Nemausus, which Frenchmen now call Nîmes, abounds in antiquities. One of them, the 20-century-old Greek-style temple, is celebrated for the perfection of its 30 Corinthian capitals. Its original name forgotten, the rectangular structure is known as the Maison Carrée (Square House). Venus of Nîmes, a statue restored from 103 fragments found in 1873, stands in the temple's museum. A companion shrine once graced the site of the Municipal Theater (center). Vegetable hawkers here push their wares to market.

As a brass band played, a religious procession filed into the square. A hundred men dressed all in white like surgeons grouped themselves to the right of the altar (page 11).

"Those are the Penitents," said Madame Crespy.

The brief ceremony commemorated events inaugurated centuries before. Indeed, one of the banners bore the inscription, "Louis VIII, Founder of the Gray Penitents, 1226."

Up medieval streets more like staircases, full of old nooks and curiously carved doorways, we approached the Cathedral of Notre Dame. Lace was displayed on walls for tourists, but we found none of the expected pictorial old ladies, with bonnets like muffins, making it. Instead, the hands making the bobbins fly belonged to Marie Camille and Mauricette Archer, aged 16 and 13, respectively. Most of the lace for which Le Puy is famous is made during the long, severe winter (page 6).

A confusing maze of twisting passages brought us unexpectedly to a broad stone staircase leading into the Cathedral. Madame Crespy pointed out above the altar the famous Black Virgin, a copy of the original which, tradition says, was brought from Egypt by Louis IX and burned during the Revolution.

Mother Prayed for Joan of Arc

"Among the many famous personages who have made pilgrimages here," she said, "was Isabelle Romée, mother of Joan of Arc, who prayed for the success of her daughter's armies."

We climbed the zigzag path leading to the Rocher Corneille, the highest point in Le Puy. Through a doorway we saw a large rectangular pool, the surface a foot or so above the floor of a huge room. A dozen women washing clothes were convulsed with laughter at the antics of one who was clowning. Seeing us, the comedienne playfully pretended to hurl a handful of wet laundry at us. Then she let it fly at one of her neighbors.

We continued upward to the rock plateau where stood the brick-red 53-foot statue of the Madonna and Child, made from the bronze of 213 Russian guns captured during the

Drawn by Harry R. Oliver and Irvin E. Abeson

Romantic Languedoc's Borders Are Etched in History and Preserved by Tradition

Once Languedoc was a province stretching from the mountainous Velay region almost to the Pyrenees, from Toulouse to the Rhône. Today it has unity mainly in the memory of a common tongue, the *langue d'oc* (pages 1, 22). Insets show the Gorges du Tarn and France in its entirety.

Opposite page: An abandoned meander of the Vis River forms the fantastic Cirque de Navacelles. The new channel runs past a tiny village (center), whose inhabitants till the dry horseshoe bed. Rock contoured by the old channel stands like an oyster's half shell. An aqueduct (lower left) stretches between tunnels. A road zigzags up the canyon wall to the high, arid plateau.

Crimean War. Climbing the inside staircase, we emerged where the crown forms a balustrade and saw the marvelous panorama from a new vantage point.

In the distance to the northwest stood the Castle of Polignac. Below us was the Cathedral. Closer to westward, at Espaly, another volcanic rock formed the plinth for an immense statue of St. Joseph. A few hundred yards from us rose the conical rock of Aiguilhe (Needle) and its little chapel. It was like a dream. Then Mary, her nose buried in a guidebook, suddenly remarked, "I'd hate to climb 268 steps to church."

We had barely left Le Puy, on a roundabout route to Mende, when a flock of sheep and goats halted us. Two tousled dogs, encouraged by a weatherbeaten woman, nipped at the hind legs of the sheep straying all over the road. The goats, more intelligent, hugged the edge, craning their necks away from us. Every mile or so brought similar halts.

Every Delicate Thread Is Set by Hand: Le Puy Lacemakers Exhibit Their Winter's Work

Catherine de' Medici in 1545 introduced lacemaking into France from her native Italy. Le Puy teaches the art to girls in its primary schools. Teen-age Marie Camille and Mauricette Archer, who throw bobbins back and forth on pillows as they twist the threads, work on the wide step outside their home. Doilies, tablecloths, and a child's dress are displayed for sale on the walls (page 5).

About 15 miles from Le Puy we found strung out along the road the little place called Le Monastier, where Robert Louis Stevenson had bought dainty Modestine and set forth in September, 1878, on a 12-day hike entertainingly recorded in *Travels with a Donkey in the Cevennes*. He described it as a place of bickering, but the only argument we noticed was between two scrawny dogs snarling at each other in a doorway.

In a typical provincial French bakery we bought a thin two-foot loaf of bread for a picnic lunch. The tiny bakeshop in the rear was almost in darkness, yet the baker was kneading dough. Apparently he could do it blindfolded.

By chance we met the daughter-in-law of the owners of the hotel where Stevenson had stayed. She said that, the year before, a young lady from London had duplicated the famous author's journey. She had been greeted everywhere with banners, speeches, and festive hospitality—far different from the open amusement, misunderstanding, and frugal kindness that variously had attended Stevenson.

Though we could not follow his cross-country trail exactly, our route included many of the places he mentioned—Pradelles, Langogne, Luc, La Bastide. The automotive age has brought changes that made it difficult to recapture much of the flavor of his book. Not until a few days later at Le Pont de Montvert, on the southern slope of Mont Lozère, in the valley of the infant River Tarn, did we find a place as he had described it.

"I should find it difficult," Stevenson wrote,

French Pigs Come Equipped with Handles Such as Tails and Ears

Exploring Le Puy, the author was startled by four men waving sticks as they chased a loose porker. When the animal darted beneath a café's sidewalk tables, a woman screamed, upset her table, and spilled her coffee. Captured, the pig was hustled without leash or goad into this waiting truck. Here a driver, seizing a hog by the tail and preparing to twist an ear, shows how the runaway was propelled (page 2).

"to tell in what particulars Pont de Montvert differed from Monastier or Langogne, or even Bleymard; but the difference existed, and spoke eloquently to the eyes."

We sensed that difference and noticed that, as he put it, "the place . . . wore an indescribable air of the South." Definitely there was a greater liveliness in the speech and manner of the people.

Paul Piq, of the Gendarmerie, climbed into the car to escort us through the narrow streets. We parked near the river and crossed on foot the old stone bridge (page 14). In the tiny cobblestoned street an old man on his way to market held two pathetic squealing kids, up to their necks in gunnysacks.

At a small hostelry, the Hôtel des Cévennes, that had lodged Stevenson, Paul introduced us to the proprietor, Roget Chapelle, the acknowledged historian of the town.

A Cradle of Wartime Resistance

In rapid-fire French he told me of the turbulent history of the remote valley. He had traced it back to 600 B. C., when it was inhabited by Ligurians. They had lived undisturbed by wars outside, even when the Romans built a camp on Mont Lozère.

"In 1209," he said, "Pope Innocent III sent Simon de Montfort to wipe out the heretics of Albi. After a battle at Muret, about 400 defeated Albigeois fled up the valley of the Tarn and established a small colony on a hill near Le Pont de Montvert, where they could continue their form of worship. The ruins of this settlement still remain. The Albigeois

and the Ligurians intermarried, and some of the present inhabitants are their direct descendants. Not many outsiders came here until a few generations ago."

This was one of the Huguenot districts, and he told of the Camisards and the terrible War of the Cévennes that began here in 1702.

Of more recent interest was his claim that in this region had begun, in 1941, the resistance movement out of which grew the Maquisards, or Maquis, who so harassed the Nazi oppressors.

"At that time," he said, "we helped Jews fleeing the Nazis and hid them in mountain farms. Later we saved French youths from German labor camps by providing false identification papers. In 1944 General de Gaulle sent officers to train us in guerrilla warfare."

Sheep Cost the Causses Their Soil

From the pleasant town of Mende we explored the vast area of high plateaus known as the *causses*. The word (pronounced to rhyme with "dose") comes from the Latin *calx*, meaning calcium or limestone, which forms the land.

The area was once a great forest, but after the Revolution the trees were felled and sheep allowed to roam at will, cropping every seedling. The soil that had been made and held together by the trees washed away, and the tablelands became deserts. Without the forest to hold it, the rain disappears through the pervious limestone as through a sieve. Yet, in spite of lack of water, small communities manage to exist.

On the Causse Méjean we saw a patch of soil sown with oats. It was so pitifully full of rubble, we wondered that it would support a crop. Yet the villagers raise sparse crops of barley, oats, potatoes, and hay. Piles of rock near by indicated the prodigious efforts made to clear the little field.

One evening by the tiny village of Sauveterre we came across a haymaking scene. Dogs barked and played tag. Men, women, and children raked and pitched with wooden implements to fill carts drawn by pairs of acquiescent oxen. It was a cheerful tableau. All talked happily, and occasionally there would be a burst of song, as if to counterbalance the barren sadness of the land.

Most genial of all was a man atop a high-piled cart, who had lost his right arm in World War II. Queried on his means of livelihood, he replied, "Almost all of us Caussenards produce sheep's milk for making Roquefort cheese" (page 18).

The causses are mainly the property of big landowners, who lease them to farmers at variable rents, adjusted according to the market prices of their produce.

Below the surface, the causses are honeycombed with caves, grottoes, passages, underground rivers, and potholes known locally as *avens*. One afternoon we explored the Aven Armand. After donning coats and sweaters, we slithered down a steep man-made tunnel more than 200 yards long. Condensation had made it slippery, and to unaccustomed muscles the exertion made our knees wobble before we reached the bottom.

Emerging, we found ourselves in a chamber so vast that the Parthenon in Athens could have stood in it with room to spare. The sight was stupendous. Above us, in the middle of a huge red-rock dome, we could see a dark hole. This was the bottom of a 130-foot shaft leading to the surface. The aven is shaped like a fat, irregular bottle with a long neck.

Below us was a forest of giant stalagmites, some almost 100 feet high. Powerful electric lights shone alternately bright and dim as we wound in among them and examined the detail of their intricate and fantastic shapes. In 1897 the discoverer, Louis Armand, torch in hand, was lowered down the vertical shaft, then 115 feet more to the bottom of the main vault. Imagine his feelings when he saw this monumental fantasy for the first time!

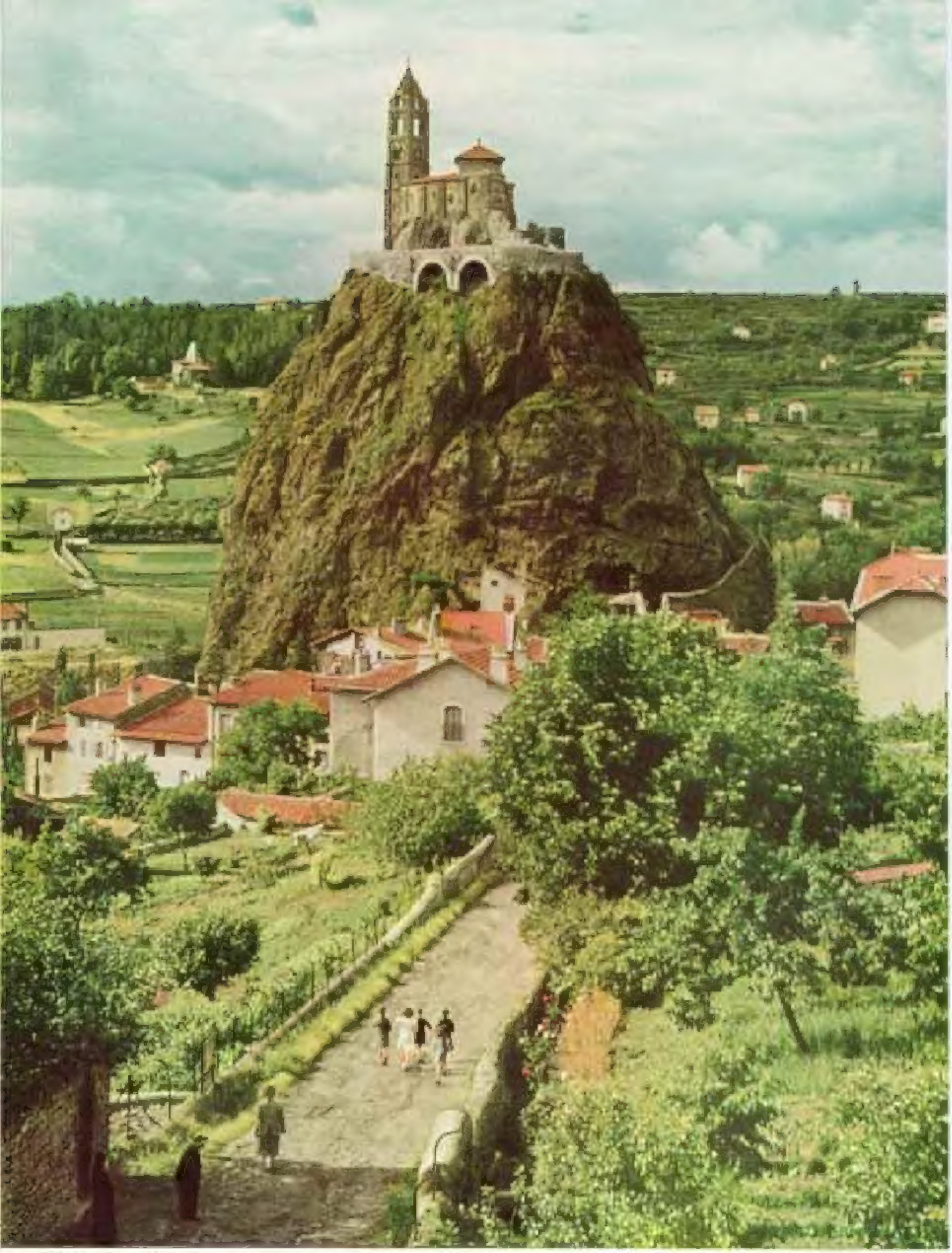
In the Gorges of the Tarn

Several spectacular rifts cut through the region of the causses. The finest of these, the Gorges du Tarn, impressed us deeply. The multicolored cliffs, with variform rocks and mysterious caves, the blue-green river and shining white sand bars, the ancient terraces, the living verdure, the purple distances—these alone would have sufficed. But blending with Nature's artistry were charming little towns and villages, fairy-tale châteaux, castle ruins, and venerable churches, rich in history.

One morning we zigzagged down into the wide, green valley of Ispagnac, where the gorges begin. A dainty round-arched Gothic bridge led us to Quézac. As we approached, an old man drawing water at the village well spoke to us. A genial light kindled in his eyes when we told him we were Americans. He pointed out the little church, which contained another Black Virgin, discovered in a near-by field, and indicated the 16th-century Château of Rocheblave across the river.

"Quézac has little more of interest than these," he said. "But you must come to my home for refreshment."

He lived alone in two simply furnished rooms on the second floor of an old stone house. As in many of the other houses we



St. Michel's Chapel, Ten Centuries Old, Crowns a Volcanic Exclamation Point

Ages ago the soft cone and crater eroded away, leaving a hard plug of basalt. Visitors to the 280-foot summit must climb 268 laborious rock steps. This suburban section of Le Puy is called Aiguilhe (Needle) because of its prominence. Le Puy, too, is aptly named; it means "the Peak" in the Auvergne dialect (page 10).

Penitents Robe Like Surgeons For a Eucharistic Congress in the Pilgrimage City of Le Puy

Poligrad Castle's Square Donjon Rears from a Base of Frozen Lava

[illegible]

Red Rock Girdle the Fortress; Farmers Till an Ancient Volcanic Bowl

[illegible]

Le Pont de Montvert Sits in the Heart of the Cevennes

Frances Sandys Dixon's Take to the Open Road with Bikes and Trailers . . . Town Girls Wear Carpet Slippers at Le Monastier

Peter Schlieser Looks Down a Thousand Dizzy Feet into the Earth's Wild Corrie

[illegible]

[illegible]

[illegible]

[illegible]

"Made in Millau" Spells Glove Perfection

[illegible]

[illegible] could have given no [illegible] response to a [illegible] learned that the hotel is owned and controlled by the largest producers of Roquefort cheese, the Société Anonyme des Caves et des Producteurs Réunis de Roquefort.

That evening a party of distinguished looking men dined at a long table, conversing with particular [illegible]—producers [illegible] of Roquefort cheese. They were the board of directors of the Société, [illegible] The board, all [illegible] for its annual meeting, included a former [illegible] general and a former executive of Rothschilds.

Realm of the "King of Cheeses"

Our own dinner was an experience. A waiter placed a [illegible] Another laid [illegible] on [illegible] table. A third inquired what kind of cheese we preferred for our [illegible].

Two helpings of superb crayfish soup, trout smothered in [illegible] buttered [illegible] a [illegible] brought me to the [illegible] course. Then a [illegible] waiter, elbows [illegible] between [illegible] of the [illegible], flourished an enormous wedge of cheese.

My appetite was [illegible], but I [illegible] myself. I [illegible] when I think of the consternation such a [illegible] would have caused. Was this not Roquefort, "King of Cheeses"? Some might dispute the appellation, but certainly in Roquefort cheese is king.

[illegible] the waiter watched until I [illegible] tasted the [illegible] morsel. Still careful not to offend, we struggled through three desserts, then retired to sleep until factory whistles, announcing the next day's two-hour lunch period, awakened us.

His matter-of-fact remark expressed the [illegible] attitude toward water in this wine-drinking country. Much drinking water is sold in bottles, for some sources are contaminated.

After a strenuous day we welcomed the hospitality of the Grand Hotel at Roquefort-sur-Soulzon. [illegible] the [illegible] table, it has only [illegible] guest rooms. The manager and chef of [illegible] the excellent Mon-

Later, as we climbed the hill to the large quarters of the Société, we sniffed cheese-laden breezes through [illegible] windows along the sidewalk. Our guide [illegible]

[illegible] explained the cheese-making process [illegible] while [illegible] on through the caves.

Sheep [illegible] is used ex-clusively," he said. "[illegible] [illegible] throughout the [illegible] Country, it is curdled, packed into molds, and injected with spores of *Penicillium roqueforti*. After a few days salted [illegible] the [illegible] it's brought here to [illegible]. This [illegible] [illegible] a period before being sent to the [illegible] room."

As he spoke, we entered a large room, the rock floor of which was reinforced with massive concrete piers. The wet floor was covered with creamy white, salt-crusted cheeses. [illegible] [illegible] stacked on tables. [illegible] [illegible] women in [illegible] were rubbing cheeses with salt, [illegible] the [illegible] of their work [illegible].

A Question of Ventilation

"After the salting, the cheeses start [illegible] [illegible] when they are pierced and pricked with needles [illegible] [illegible]," said [illegible]. "The holes permit air to penetrate them, so the mold grows equally on all [illegible] and [illegible] the [illegible] [illegible] green mold."

[illegible] he took us [illegible] [illegible] [illegible] wooden racks stacked high with the [illegible] porous cheeses. "Here they ripen in [illegible] [illegible] 50 [illegible] or [illegible]. There are [illegible] more floors like this [illegible] [illegible]."

"The [illegible] [illegible]," he proudly continued, "is due to ventilation from natural fissures in the rock, which maintain the air constantly at about 44 to 46 degrees Fahrenheit and 95 percent relative humidity."

He [illegible] his [illegible] when Mary asked if rats [illegible] [illegible] [illegible].

"[illegible] [illegible] attempt [illegible]. They [illegible] [illegible] [illegible] cheese [illegible] [illegible] hungry, they always eat [illegible] cheese before starting a new one."

It takes a million sheep and [illegible] farms to supply the milk for the [illegible] producers whose average annual output is more than 20,000,000 pounds of cheese. Of this, the Société produces more than half.

Women were wrapping cheeses in [illegible] [illegible] with a [illegible] as a vent for gases that would form during ripening.

"The Nazis were [illegible] in our [illegible] [illegible], but we [illegible] [illegible] [illegible] [illegible] [illegible]," said [illegible].

"During the war," [illegible] [illegible], "it was forbidden to listen to French-language radio

What's Cooking? Roquefort's Master Chef Has the Answer

Monsieur [illegible] [illegible], manager of the Grand Hôtel, [illegible] [illegible] [illegible] [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] roast chicken, and [illegible] [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] Roquefort [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].

Pont du Gard Endures as a Radical Monument to Romans Who Built It 20 Centuries Ago

[illegible]

[illegible] from London. We learned recently in a radio [illegible] from [illegible] where [illegible] daughter Sept. 11, 1944, when she spoke her first words. They were "Ici Londres" [This is London]."

About 30 miles north of Montpellier is the town of Millau, which made for itself a [illegible] name of French gloves. Here there are more than 50 small firms and a "Big House," of which the house of [illegible] is most attractive. This town is especially proud that all its gloves, even those of leather, are washable.

News of a week-long festival to begin at Nîmes any day [illegible] led us eastward to the valley of the Rhône. We seized the opportunity to visit old Nîmes with its well-preserved Roman temple, the Maison Carrée, which so pleased Thomas Jefferson that he used it as a basis for the design of the Virginia State Capitol at Richmond (pages [illegible]). Nearby, [illegible] miles away, is the towering Pont du Gard, part of the aqueduct built by the Romans for the Nîmes water system.

While nearing Nîmes we noticed brown fields of what appeared to be large thistles. They grew in profusion and were gradually reaching their mature state. The prickly seed heads were [illegible], hooked at the ends, and were covered systematically with large curved barbs. These proved to be teasels cultivated for use as the textile [illegible].

The Aqueduct's Waters Flow No More; Grass Grows on Stone

[illegible]

Lowly Thistles Help Make Cloth

In Tarascon we later met Alphonse [illegible], who is engaged in the ancient business of growing and selling teasels, took us through his plant. Several girls were clearing the stalks from a mound of teasel heads. A machine sorted them according to size. Other girls cut them to [illegible] lengths and drilled a hole through the center of each.

In the factories they card up the nap of cloth by passing it over rotating teasels fastened on spindles or copper cylinders. This process is used in the manufacture of such products as military wool sweaters, fine gloves, [illegible] blankets, mattresses, and the felt belts used in paper mills to carry the wet pulp of paper in the process.

"We ship teasels all over the world. These are going to New Zealand," he added, indicating a wicker crate marked 125 Kg. [about 275 pounds].

On our way westward from Nîmes we admired the stately Roman buildings and monuments, pleasant avenues, and wide boulevards of the university city of Montpellier. Here among a fine collection of paintings in the

Twenty-three Sets for Golden Flowers in the Language of Yes

Bread Eater and Mattress Makers Carry On Their Pursuits in the Public Square of Albi

[illegible]

Musée Fabre I was surprised to find a picture of the "Infant Samuel" by Sir Joshua Reynolds. He painted the child Samuel in half a dozen poses, the best-known version being in the National Gallery in London.

Plane trees bordered the road for miles as we left Montpellier. These long avenues of majestic shade trees, with leaves like our maple and bark like the sycamore, [illegible] scenes, form [illegible] approaches to many French towns.

The approach to Albi was no exception; but the trunks were being swathed in pads of straw to protect them from racing cars and also to soften the shock of collision for the drivers—during the running of the Grand Prix Automobile at Albi.

A Cathedral Like a Fortress

Forbidding as a fortress loomed the red-brick Cathedral of Ste. Cécile, dominating the skyline (pages [illegible] and [illegible]). Its sheer fortified walls, narrow loophole windows, and [illegible], and single tower, like a castle keep, give it an air of grim severity. It was conceived in the 13th century by Bishop Bernard de Castanet, first Inquisitor of Albi, who spent himself stamping out what remained of the Albigensian heresy and appropriating the property of the victims.

Next day, led by Jacques [illegible], whose [illegible] was an old and historic Albi family, we [illegible] from many different [illegible] later [illegible] our way over [illegible] and groped through dark narrow old streets to view the massive cathedral's [illegible] from many angles.

To gain the floor level of Ste. Cécile, 30 feet above the street, we climbed a stairway to the [illegible] Porch, [illegible] and [illegible] flight of ornamental stairs to the huge cathedral's [illegible] The Flamboyant Gothic [illegible] contrasts effectively with the mellow reddish

[illegible]

[illegible]

"Magnificent Folly"

[illegible]

[illegible]

How to Hold Your Girl

[illegible]

[illegible]

Vineyards Suffered in Wartime

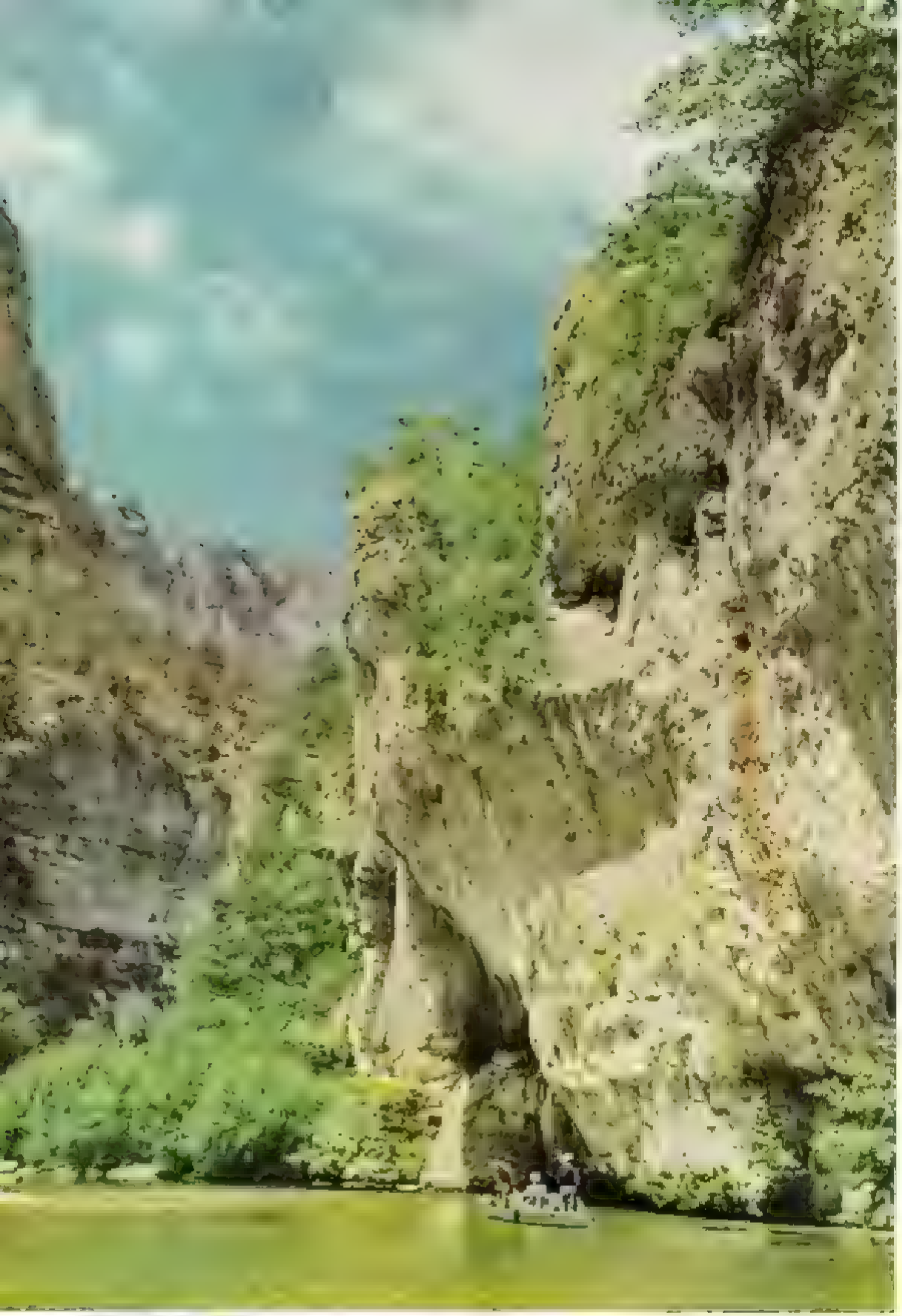
[illegible] Philip, who owns a small vineyard near Chateauneuf, told us the vines were neglected during the war and are still not back to normal.

"The Nazis commandeered all but the best horses," he said. "Manpower was short, many workers being absent as prisoners of war in Germany. We lacked fertilizer, sulfur for dusting, copper sulphate for spraying, and chemicals such as arsenic and nitrate for combating disease in the vines. Horse

[illegible]

Farmer's Daughter, Cooking Stew, Quickens the Flames with Bellows Tube

* Casulbone Hangs Above the Turn Like an Indian Pueblo



Creamy Limestone Cliffs Capped with Green Overhang in French Grand Canyon

[illegible]

Dungeonlike Towers and Loopholes Give Albi Cathedral a Fortress Look

Medieval Painters and Sculptors Made Stone Come Their Masterpiece

[illegible]

Seraphs and Cherubs Parade Across the Cathedral's Gold and Sky-blue Ceiling

[illegible]

Ste. Cecile's Mellow Brick Glows in Morning's Golden Light. Old Bridges Cross the Tarn

[illegible]

Blue Sky, Fleecy Clouds and Yellow Grass Splash Color Across the Crosse du Lazau

Dreamlike Carcassonne Springs Out of the Age of Knights. Towers and Mile-long Walls Present an Incredible Picture

[illegible]

Sightseers Take a Fairytale Tour in Carcassonne

[illegible]

Bursting Rockets Paint the Sky; Carcassonne Burns with Simulated Fires

Flares Stab the Darkness, Growing Ruoparts Seem Ready to Melt and Topple

[illegible]

Polled Sheep, Including a Few Black Faces, Graze a Trail Up Mount Aipinal, Their Summer Pasture

[illegible]

Cured in Caves, Cheese Is King in Roquefort

Mounted on Mattresses, These Sharp-pointed Tensions Bristle Up the Nap of Woolens and Felts

table and produce for tourists were also in short supply.

Lacking the constant attention they require, the vines weakened and many died. Some were destroyed because Vichy made the growers plant other crops. It is a slow task to replace them. After deep plowing to get rid of old roots, the soil must be planted for two years to a cover crop, then two years to grain, before new vines are planted. Two more years pass before they bear their first fruit.

Half the World's Wooled Sheepskins

From Carcassonne we headed for Mazamet, a town of 15,000 inhabitants, below the northern slopes of the Montagne Noire. An astonishing [illegible] remote mountain town is an industry that has grown up during the past 100 years—that of delainage, or separating wool from sheepskins imported from all parts of the earth.

Mazamet's annual purchases of woolly sheepskins from the great producers of the Southern Hemisphere had almost reached the prewar level of [illegible] tons [illegible] more than half the world's production. About [illegible] percent of the pulled wool [illegible] to England and the rest goes to France's own textile industry.

Some of the skins after pulling are sent to the United States, but in normal times most are tanned locally into leather for shoes, handbags, and the like and exported mainly to Germany, the Benelux countries, Scandinavia, and North Africa. The tanning industry was hard hit by the economic upheaval following the war and is still struggling to regain its former stature.

Pyrenees Dim in Distance

Leaving Mazamet, [illegible] we climbed up and over the Montagne Noire and nosed down into the vast plain of Carcassonne. In the distance to the south, we could dimly discern the Pyrenees. A huge cloud shaped like a horn of wind from Spain hovered at the end of the range, where it goes down to the Mediterranean.

From Carcassonne's [illegible]-encircled Ville Basse, or Lower Town, we reached the old stone bridge over the River Aude and caught our first thrilling glimpse of the Cité, the fortress city. There it had stood for centuries, commanding the strategic approaches to Catalonia (pages [illegible]).

A few minutes later we entered the old city across the drawbridge of the Porte Narbonnaise.

[illegible] hotel, [illegible] be brought up to the [illegible] entrance of the Hôtel de la Cité. The only hotel within the ramparts, it is almost as great an attraction as the fortress itself. Some [illegible] were [illegible] by a [illegible] parapet overlooking the Ville Basse.

When we went down to the [illegible] dining room decorated with [illegible] and [illegible], I ordered a specialty of the [illegible] and [illegible] It was [illegible] in [illegible] days.

After a stroll in the garden we lingered on our balcony, watching the distant lights twinkling. Carcassonne seemed to [illegible] all that was romantic. We could imagine knights and ladies [illegible] long [illegible] and flowing gowns [illegible] the ramparts [illegible]

What was that?

Scene Straight from Middle Ages

A sharp command, uttered in military fashion, [illegible]. A light suddenly illuminated a corner tower on the ramparts to our left, and there, in chain mail and [illegible] helmet, stood a soldier of the Middle Ages. It was weird and startling, as if our thoughts had suddenly materialized. Then [illegible] the vision was gone.

We knew we hadn't been dreaming, and hurried out to investigate. A few minutes later we were seated under the stars in the open-air theater watching Henry de Montherlant's *La Reine Morte* performed by a cast from the Comédie Française, using the ramparts as a stage.

Next morning when we ordered tea for breakfast, Mary was amused [illegible] the tag [illegible] to the tea [illegible] It read: *Thé [illegible]* [illegible]

Fencers Vie on Bastille Day

Metallic clashing sounds of swordplay and shouts [illegible] the garden [illegible] window. Below, under the trees, were [illegible] figures vigorously parrying and thrusting.

It was Bastille Day, the French national holiday, equivalent to our own Fourth of July, and this was the annual fencing tournament [illegible] of Carcassonne for the Cup of July 14th. There were five teams—two from Toulouse and one each from Carcassonne, Perpignan, and [illegible]

At the end of the all-day match, [illegible]

Masked Swordsmen Lunge with Foils. Their Shining White Armor Is Padded Canvas

[illegible]

[illegible] presented [illegible] to the capital of the world [illegible] distributed to [illegible] the disorganized [illegible] a great [illegible] of [illegible] a [illegible] stragglers, a [illegible] seeks [illegible] several hundred [illegible], and more other [illegible]

In [illegible] to his [illegible] such [illegible] prizes [illegible] 25 [illegible] the last four [illegible] judges, and [illegible] was [illegible] personal [illegible]

Madame [illegible], who [illegible] at the University of [illegible] was our guide as we [illegible] the tapestries. In [illegible] English she [illegible] in [illegible] detail all the [illegible] methods [illegible] military [illegible] had devised for resistance attacks.

[illegible] well [illegible] the [illegible] made for [illegible] sieges, that every [illegible] means [illegible] in its [illegible]. [illegible] was an important [illegible] in [illegible] ranges for resistance and [illegible] of an [illegible] had [illegible] from the most unexpected places.

When in the end of the 14th century the great fortress reached the zenith of its [illegible] it remained impregnable until the [illegible] of [illegible] such as [illegible] Louis IX and [illegible] in [illegible] of [illegible] wills and [illegible] and the sea, [illegible] the [illegible], for the [illegible] of the dead [illegible] complained for [illegible] to [illegible] and [illegible] the [illegible] tapestries.

By 1555 the Gate had [illegible] as a [illegible] for the very poor and was about to become a [illegible], when the [illegible] architect, Viollet le Duc, commenced the task of restoration.

[illegible] the [illegible] which guarded [illegible] from the River [illegible] [illegible] substan-

As the Farmer Cuts His Wheat, Hungry Sheep and Goats Rush In; Their Bells Tinkling

[illegible]

trolley as Fabre left [illegible]. No more perfect [illegible] military [illegible] could be imagined.

At intervals all day, the stirring strains of "The Marseillaise" were wafted up from the Ville Basse, where other Bastille Day celebrations were in progress. As is customary in France, there was a bicycle race, and the boulevard was lined with spectators fluttering small tricolor flags.

Carcassonne's Ramparts Aflame

Photographer Armand Duncan had [illegible] for time to view the Cité fireworks display. As darkness fell, the streets were filled with people hurrying to strategic vantage points.

Near the zero hour, on the far outskirts we could see scattered flashes at neighboring [illegible]. Occasionally a [illegible] would [illegible] for a few seconds.

Suddenly the silence was shattered by a violent detonation. The show was on!

For twenty minutes [illegible] rockets [illegible] filled the sky.

Then followed a dramatic spectacle. All along the ramparts [illegible] the entire Cité seemed in flames [illegible]. Its towers and crenelated walls, its castle and cathedral stood out starkly [illegible] in the [illegible] atmosphere. [illegible] an invading army in the surrounding darkness.

For several minutes the "fire" [illegible] then gradually subsided. [illegible] into the [illegible] of history, the fortress [illegible] into the night and all was dark again.

A haunting fade-out, we thought. Next morning we left Carcassonne, but the memory [illegible] for our journey [illegible] lingers [illegible].

Frost Outside, Yet Bananas, Papayas, and Vanilla Thrive in Longwood's "Tropics"

[illegible]

Wonderland in Longwood Gardens

By [illegible] C. [illegible], Jr.

"THERE are two things [illegible]

[illegible]

[illegible]

Lights Play on Shimmering Water Curtain

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Nature and Artifice Blended

[illegible]

[illegible]

[illegible]

Trench System on Fountain Keyboard Plays Symphonies in Water and Color

[illegible]

[illegible] Water Display—Pushbutton Style

[illegible]

[illegible] colored lights and water. [illegible] Water Flower came to Dressed in [illegible] under Mr. [illegible] Fountain system [illegible] New York [illegible] Water Show.

The [illegible] is 600 feet [illegible] Longwood's largest [illegible] By use of compressed air [illegible] 100 feet in the air [illegible] 12-[illegible] 172 feet [illegible]

[illegible]

One Orchid Requires Eight Years to Bloom. That's Why Corsages Are So Expensive

[illegible]

The entire fountain system in front of the conservatory uses about [illegible] gallons every hour.

But Mr. Fraser told me [illegible] only about three percent of the water [illegible] and wind.

The rest flows through the basins, [illegible] underground pipes and back to the pump house where it started. Here [illegible] huge pump motors, two air compressors, and five transformers supply light and power.

Water is supplied by Longwood's own artesian wells and [illegible] the fountain basins, [illegible] pools, and underground reservoirs.

Should all of Longwood's fountains—conservatory, [illegible], and [illegible] the formal [illegible] water garden—be turned on at once, they would require a total of [illegible] gallons every minute.

Such facts amaze the visitor. He begins to grasp the magnitude and intricacy of the operation. But facts and figures are no means to impress him; only his eyes.

Probably the greatest attraction at Longwood and the one seen by most persons is the conservatory. Here the visitor finds a lavish [illegible] of [illegible] covering more than [illegible] acres, or [illegible] square feet under glass.

Longwood Springtime Is Eternal

Conservatory gardeners [illegible] at blooming seasons. Even when snow [illegible] the woods [illegible] there is an abundance of flowers.

Beneath glass gardeners create spring, summer, or autumn. Each year they [illegible] greenhouse [illegible] climate [illegible] Central American jungle [illegible]. I have seen roses blooming in one, carnations and snapdragons in another, all out of season.

In [illegible] fruit trees [illegible] pastures

as sweet-[illegible] foliage: hyacinths, daffodils, and tree ferns.

I stepped from the Temperate Zone into the Tropics and found orchids in full flower (page 53). Here I found small oranges, trees with fruit-laden branches, red-berried coffee trees, a breadfruit tree, vanilla vines (page 48), bananas, and passion flowers.

I looked up above the other plants and saw stalks of bananas. Old-timers on the Longwood staff remember when President Calvin Coolidge visited the 1,000-acre estate. He was silent as a tour of the conservatory saw everything, but made no comment. Then he looked up and saw bananas growing. He studied them for several seconds, turned to his guide, and remarked, "Bananas."

Desert plants of all sizes and unique forms and flowers fill the cactus house. One cactus of the genus *Opuntia* grows so well that more than two tons of its thick leaves and stems have been hacked off to keep its size down.

I saw what looked like a man from Mars. He wore a gas mask, large gloves, boots, and a heavy apron. A spray gun nozzle whose hose was attached to the large tank strapped to his back. He was on his way to gas pest trees with a new type of aerosol bomb.

"Everything Under the Sun"

Being able to grow "nearly everything under the sun," as John H. Marx, superintendent of horticulture, puts it, requires an elaborate heating and ventilating system. Temperature and humidity are of prime importance. Azaleas and camellias (page 55) must be kept relatively cool, between 45° and 60° F. Bougainvillea (page 57) gets about 70° during the day. For orchids 65° is minimum, 80° desirable.

In the T-shaped main display room, every newcomer finds the floral wonderland he dreams of. Plants in bloom are brought from the greenhouses and stock, pots and all, into beds and borders edging the lush green lawn (page 55). The visitor can see flowers of all descriptions, everything from agapanthus to wisteria.

No plant is permitted to fade or wilt. Constant bloom goes on throughout the year, from January's cyclamen and hyacinth to the Christmas poinsettia (page 58).

The conservatory staff of 22 forces a variety of plants in succession (page 56). Thus the display room has tulips and other spring flowers over a three-month period. After that tulips bloom in the outside gardens. By planting at intervals, the greenhouses have sweet peas seven months of the year. Some plants, like orchids, bloom all year.

"Visitors like to ask questions, and I must often make comparisons," explained Mr. Marx. "Once a lady expressed her comfort to me: she remarked that even Longwood seemed to have trouble with black spots appearing on the leaves. She said, 'I get rid of mine with a broom. A spray does no good.' We had to tell her those were spores."

The collection of shrubs and trees at Longwood is among the largest in the United States. Different families of plants number well over 200, with many varieties of each. Many horticulturists refer to Longwood as "America's finest garden."

Another Longwood feature is its organ, among the most complete ever built. An organ is considered large if it contains as many as 4,000 pipes. Longwood's has 10,000.

The instrument measures 75 feet long, 45 feet high, and 30 feet deep. The pipes are housed in chambers equivalent to a 3-story house. The largest pipe stands 32 feet high and has about 16 vibrations a second; the smallest, corresponding to a tiny whistle, has about 8,000 vibrations. The organ is powered by three electric motors.

The organ also has a percussion division called "the jazz band," including kettledrums, bells, triangles, chimes, tambourines, cymbals, and xylophone. In addition, it has a grand piano, three harps, a celesta, and Chinese gong. With its 240 stops, organist Firmin Swinnen can produce almost any musical effect he desires.

Mr. Swinnen, who became Longwood organist in 1923, has given more than 1,500 Sunday afternoon concerts.

Longwood is a community in itself. It has its own fire department, research, water system, hospital room, golf links, and almost 100 specialists' houses and dormitories. Its 250 employees and their families eat dairy, poultry, fruit, and vegetables from the Longwood farm.

In one month Longwood uses 450,000 kilowatt-hours of electricity, enough to supply an average family for about 22 years. It requires 290,000 cubic feet of gas monthly, which would cook the meals for one household for nearly seven years. More than 10,000,000 gallons of water are used each month, a 100-year supply for one family.

This "little city" is a part of Longwood that visitors rarely see. They are much too busy gazing in awe at the magic fountains, exotic flowers, and glorious gardens.

And what interests city dwellers almost as much is the fact that everywhere they hear birds—[illegible] birds, [illegible] used only to sparrows and starlings called them.

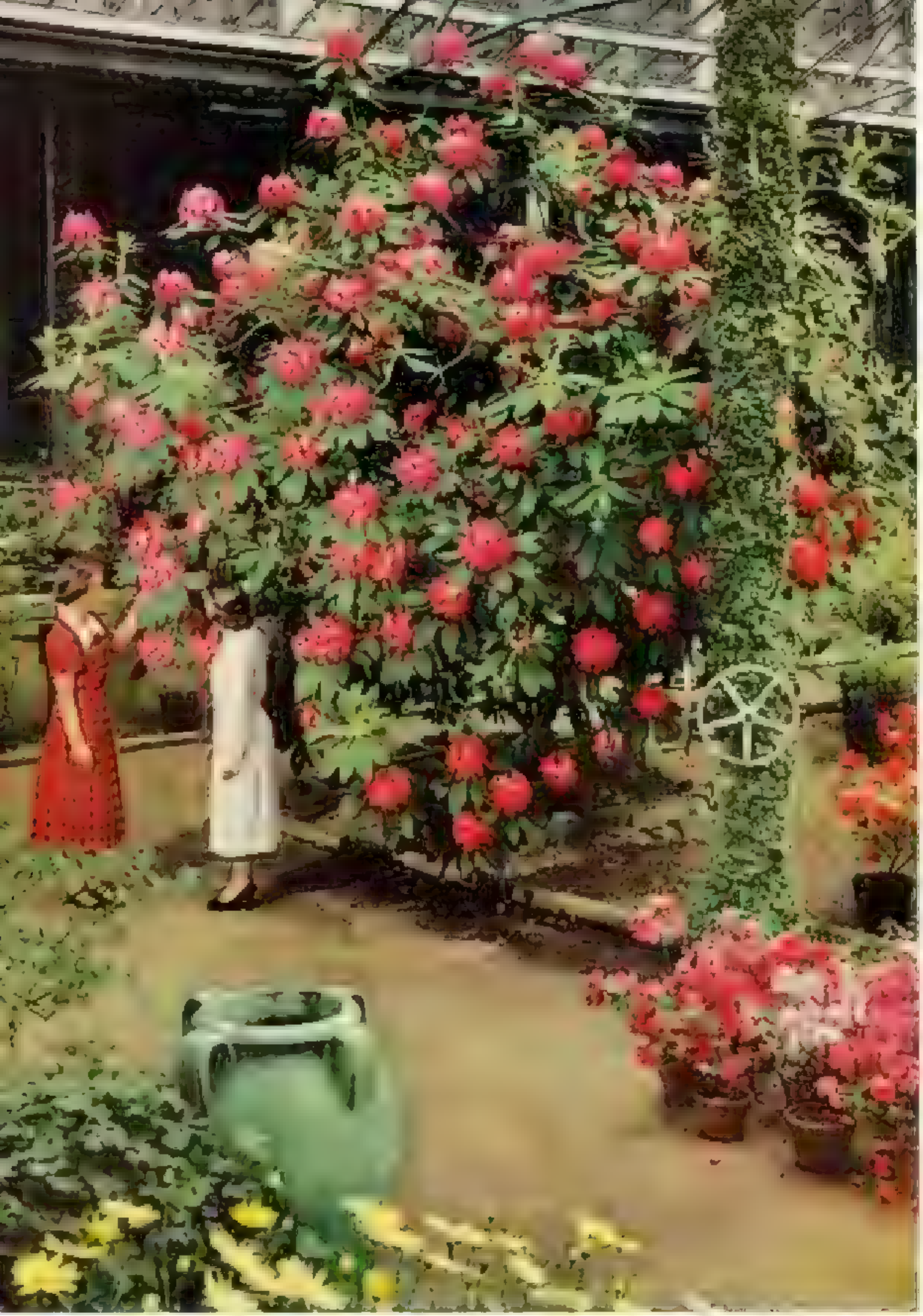
Longwood's Fountains, Like Geysers or Fireboats in Dead Center, Drench the Sky

Old Faithful Spouts Lose Its Sometimes at McCarren

[illegible]

Spectators Scamper as Fickle Winds Scatter Spray

[illegible]



In April the Rhododendron Bears a Treedal of Blazing Color

Old Earthlings Approach Effect Is Called the Peacock Tail

[illegible]

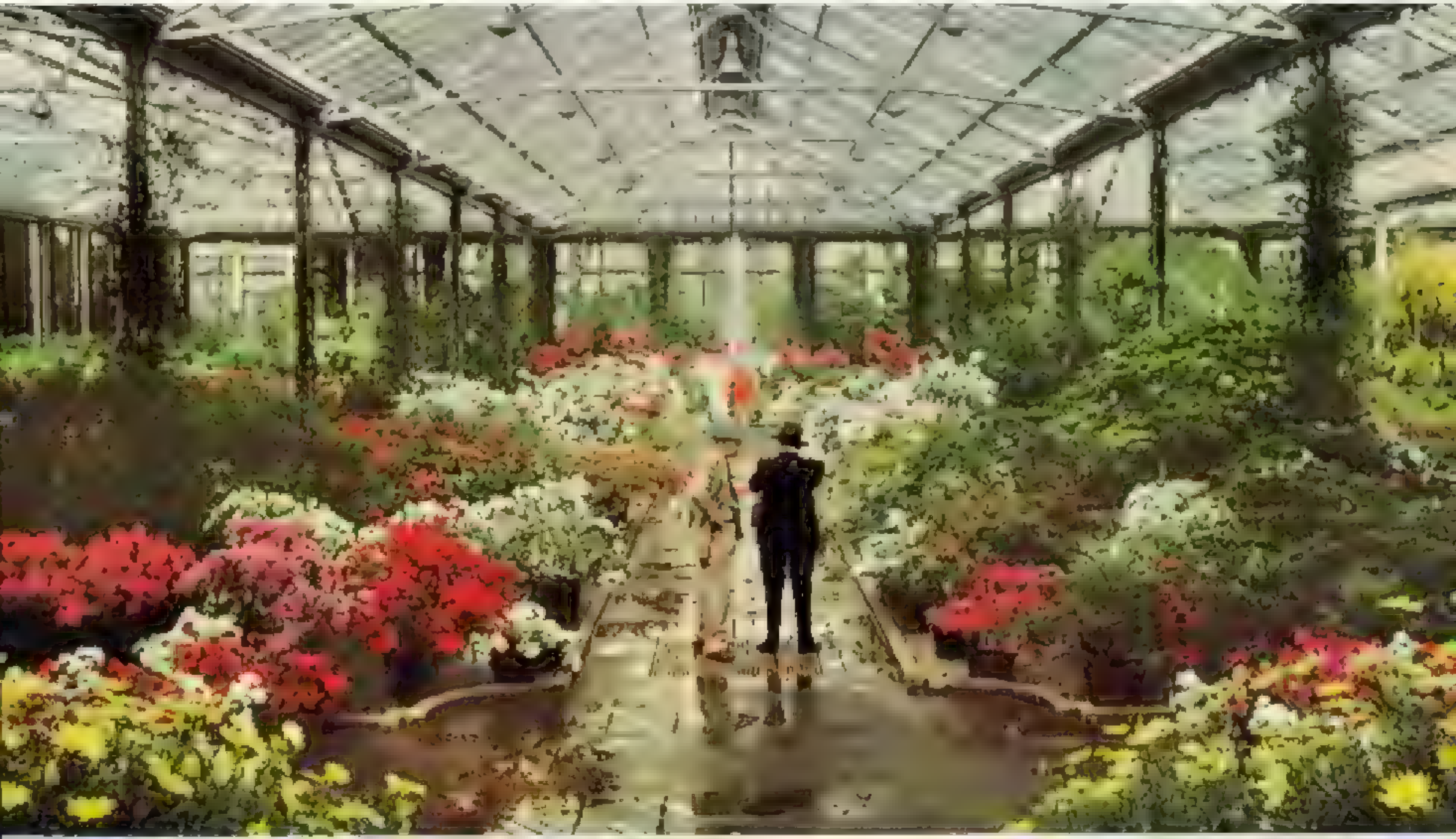
Australian Tree Fern Spreads Above Anza's Grounds

[illegible]

Visitors on the Conservatory's Terrace Admire the Rounded Boxwood and Cubed Maples

Here the [illegible] gardens [illegible] the [illegible] terrace [illegible] the [illegible]

Moistened Walks in the Greenhouse Satisfy the Azaleas' and Camellias' Craving for Humidity



A Gardener Checks the Temperature in No. 4 Growing House

Begonia Seedlings, Grown Indoors, Fill Row on Row of Pots

[illegible] Dine on a Perfumed Banquet Hall

[illegible]

No Flower Ever Fades in Lunsterstory's Display Room

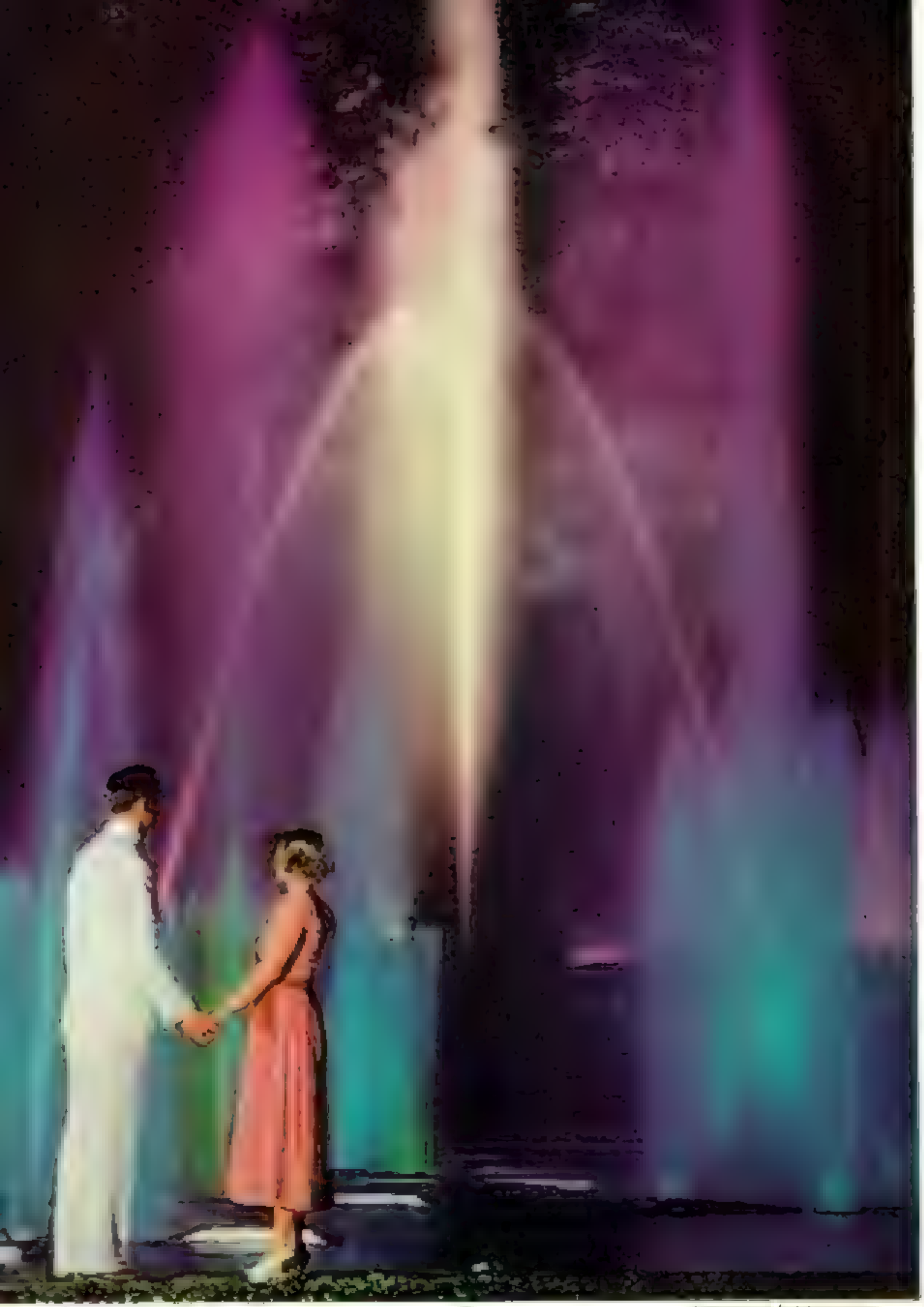
[illegible]

Poinsettias Flame at Christmas in the Fern Passageway . . . Nectarines Are Picked in May under the Conservatory's Glass

Ladies of the Chorus Try On Gowns in a Dressing Room Beneath Longwood's Outdoor Stage

[illegible]

Petruccio's Players, Officers of the Dragoon Guards, and the Chorus of Rantorous Maidens Rehearse a Curtain Call



Fairyland's Mist and Color Campose Liquid Fireworks: the Stage Fountains

Labrador Canoe Adventure

By Andrew Brown and Ralph Gray

With Illustrations from Photographs by the Authors

TWO Indians ran deft hands and eyes over our twin aluminum canoes lying outside a warehouse in Burnt Creek, northern Quebec mining camp.

Prospectors, geologists, and [illegible] strolling by in their [illegible] clothing expressed doubts about the unfamiliar metal craft. One man, grinning, muttered something about "tin canoes."

We kept our ears cocked for opinions, for in that water-laced land canoes are indispensable for cross-country travel, and experts in their use are a dime a dozen. No one knows these northern waters as do the Indians, prospectors, and local trappers.

Despite pessimistic opinions we were confident the little canoes would carry us from the Quebec border across hundreds of miles of Labrador wilderness to Atlantic tidewater. It could be disastrous if they let us down!

We saw that the Indians admired the sleek paint [illegible] and [illegible] the [illegible] lines. But the older man shook his head and drew a hand sharply across the canoe's skin, as if slashing it with a knife.

"Mathieu says the first jagged rock will gash 'em," interpreted John Michelin, one of our trapper guides.

"Well, they weathered a rough test last summer running the Susquehanna River," we pointed out, reassuring ourselves as well as the critics.* "We'll go ahead as planned. They'll do better than you think."

At journey's end the 18-foot Grumman aluminum craft were scratched and dented but watertight and sound. And [illegible] sold them—our guides wanted to buy them.

Million-Paddle-Stroke Journey

In five weeks we paddled 400 miles on waters of Labrador's Hamilton River, trudged 60 miles over portages and around [illegible] falls, and [illegible] 150 [illegible] rapids [illegible] falls. From height of land to sea level, each of us dipped a quarter of a million paddle strokes.

We embarked near the heart of the vast peninsula of Labrador and northern Quebec (Ungava). End of our water trail was North West River trading town on Lake Melville (map, page [illegible]).

Midway in the trip we saw North America's second-greatest waterfall, the seldom-seen Grand Falls of the Hamilton, plunging almost 245 feet high (pages 75, 94, 95). [illegible] by its huge volume, these surpass it.

We traveled the interior of the land where Europeans probably made their first landfall in the New World. Yet the tides of history have largely swept by this corner of North America. Explorers mapped [illegible] coast. The wooded island [illegible] more [illegible] Labrador, still is rarely visited.

In Labrador's wilderness the dense spruce forest marches north, like an immense army, to the edge of [illegible] barrens. [illegible] feet [illegible] spongy [illegible] and [illegible] forest litter. Water [illegible] everywhere [illegible] rivers, large and small, and green marsh.

Moss takes the place of soil. [illegible] yellowish [illegible] underfoot [illegible] with the July [illegible] mosquitoes, bog, and [illegible] every step is a gamble.

Rails Soon Will Split the Wilderness

The Hamilton, Labrador's mightiest river, gathers its head from this bewildering [illegible]. Long the domain of [illegible] and canoes, its western sources soon will echo to locomotive whistles and [illegible] ore cars on rails.

For the upper Hamilton basin [illegible] part of a vast, newly explored [illegible] that straddle the Quebec-Labrador boundary. [illegible] a [illegible] railroad to carry the [illegible] of Labrador [illegible] to the Gulf of St. Lawrence. Waiting ships will load it [illegible].‡

It was early summer, 1950, when we set out to see and picture Hamilton River wilds. At Montreal we [illegible] our two trapper guides, John and Leslie Michelin, [illegible]. They had come from North West River, Lake Melville (map, pages 7[illegible]-8[illegible]).

Like most Labrador settlers, these men are of British stock, [illegible] generations ago with Indian and Eskimo blood. The Michelins have also a French-Canadian strain. John's grandfather came from Quebec.

The Labrador Mining and Exploration Company (LMEC) [illegible] the Q[illegible]

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* See "Down the Susquehanna by Canoe," by Ralph Gray, National Geographic Magazine, July 1950.

† See [illegible] Frontier [illegible] and [illegible] National Geographic Magazine, [illegible] 1949.

‡ See [illegible] St. Lawrence [illegible] National Geographic Magazine, [illegible].

Wrestling a Canoe Through Gull Island Rapid Requires a Mountain Goat's Footwork

[illegible]

[illegible] Labrador [illegible] [illegible] [illegible] flew our National Geographic party into the interior. This [illegible] [illegible] us start canoeing at the top of the country.

The [illegible] [illegible] [illegible] between the Gulf of St. Lawrence and [illegible] [illegible] [illegible] from [illegible] [illegible] [illegible] [illegible]. Trucks, [illegible] bulldozers, heavy mining and construction machinery, as well as hundreds of men and the food to [illegible] them, all have been flown over the Labrador barrens.

[illegible] [illegible] Burnt Creek we visited the first deposits whose [illegible] [illegible] find its way into American [illegible], [illegible] steel, [illegible] and cars. [illegible] [illegible] Moss, geologist, took us to old lines where crews worked [illegible] the [illegible], mapping [illegible] [illegible] (page 68).

The [illegible] and [illegible] out [illegible] of roads to [illegible] from [illegible]. A road to Astray Lake [illegible] the Ashuanipi [illegible] opened our voyage into the bush. A truck [illegible] us out to the lip of [illegible] [illegible] civilization.

On a Sunday afternoon we launched our [illegible] [illegible] [illegible] into the [illegible] waters. John Michelin, our [illegible] guide, took the helm and Andrew Brown the [illegible] paddle of [illegible]; [illegible] Leslie [illegible] the stern and Ralph Gray the bow of the blue *Tango*.

A few times during the journey we shifted canoes for photographic purposes. The guides always protested. They became attached to their respective craft.

We settled to our paddles, [illegible] [illegible] [illegible] from the [illegible]. Winding rivers and lakes lured us into the unknown. [illegible] [illegible] [illegible] [illegible] through the [illegible] beauty and majesty of an unspoiled land.

Clouds swept in and rain lashed at the tent. That storm ushered in a wet spell lasting two weeks, with only occasional interludes of fine weather. [illegible] Ralph greeted each morning with, "Well, it's another Labrador day."

One Monday, after 25 miles of paddling down Dyke Lake, we clambered up barren-topped Castle Hill. A mighty sweep of country lay revealed (page 71). Long ridges flanked the gently rolling land. Lakes filled nearly every depression. Here and there [illegible] crowns [illegible] the spruce and [illegible] forest that reached green and unbroken to the horizon. In silence we gazed out upon the stunning scene.

Beach Barely Wide Enough for a Fire

[illegible] down the swift [illegible] River next evening, our wool shirts soaked by a steady drizzle, we searched for a campsite.

"Won't this one do?" John called out as we rounded a narrow sandy beach at the foot of a 50-foot sandy bluff.

Our paddles swung the canoes in toward shore. Ralph and Andy jumped out and tied the craft to boulders.

"We'll pitch the tent on top of the bank, I bet," said John. "It's a good [illegible] got [illegible] enough ground on sand for our fire."

It took fancy stepping to move around after the fire was blazing and all the supper things were strewn along that skimpy shore. To pass the fire we had to climb the bank or wade the [illegible] river.

In gathering firewood, Andy, his arms full of wood, stepped on a stone and teetered like a tightrope walker at the stream's edge. Only a quick step into knee-deep water saved him from a headlong plunge.

Long after the sky was dark we pulled ourselves up the steep slope to the tent. [illegible] clung to our feet [illegible] and plunged into the inky blackness.

The following day was [illegible]. The rain let up and the clouds parted briefly. Toward evening we reached our first bad rapid. A seething mass of white water—the [illegible] canoeing [illegible]—[illegible] (page 82).

High water submerged the boulders in some of the rapids on our route, but huge waves in midstream of the "rattlers" just below them would have upset the canoes in a flash.

Just for a lark we might have run some of the easier rapids down the middle. We could never forget, however, that there was no help nearer than 300 miles during much of the trip. In such country, loss of a canoe or injury to a man would have been calamitous.

So, when the current began to look hard and broken, we [illegible] one side of the river or the other for the descent. Close to either bank the drag of [illegible] and shallows slowed the racing current.

John, whose self-confidence was [illegible], had a nerve-racking habit of slipping toward the brink of even the worst rapid on a [illegible] course. More than once [illegible] to right or left. [illegible] Andy, awaiting the decision, not sure the canoe would be drawn into the turmoil of midstream.

[illegible] failed to reach [illegible] water near shore. At the last second John turned the bow downstream, saying, "We'll just have to let her go." [illegible] we swept [illegible] whirls and [illegible] bobbed through safely.

[illegible] Unknown [illegible] wilderness [illegible] we made a [illegible] portage [illegible] through waters of the [illegible] River [illegible].

The [illegible] was the [illegible] of our route. [illegible] down the Labrador [illegible] a [illegible] rough road. [illegible] with boulders, gravel, and sand.

[illegible] filled [illegible] shallow depressions across a [illegible]. A [illegible] water system resulted. It is common for a [illegible] stream to find two [illegible] from a big lake.

The [illegible] River [illegible] Unknown [illegible]. The river [illegible] from one water [illegible] by two widely separated outlets. One stream flows to Sandgirt Lake. The other, Unknown River, plunges over two [illegible] waterfalls and joins the great Hamilton some [illegible] miles below Grand Falls ([illegible] pages [illegible]).

Route Unknown Even to Guides

The [illegible] route between Sandgirt Lake and Unknown Falls was as new to our guides as to us.

[illegible] most of our [illegible] on [illegible], we [illegible] and were [illegible] up [illegible] swift, boiling current and [illegible].

Often we [illegible] while [illegible] the [illegible] and [illegible] in new [illegible].

John and [illegible] current [illegible]

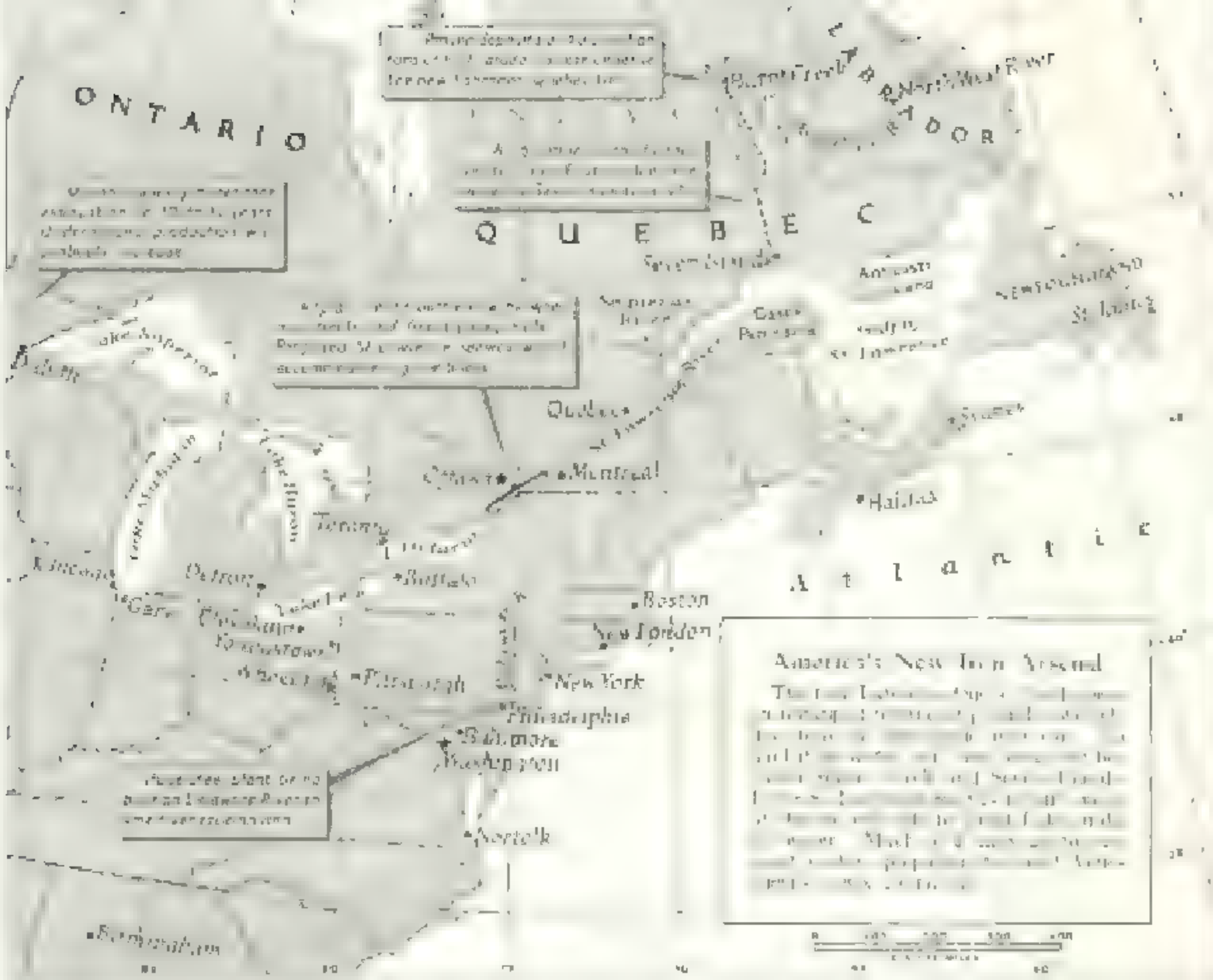
[illegible] behind that island," [illegible] "We'll [illegible] today."

Three miles up the Attikamagen we reached a [illegible] rapid. Here, and at a longer one a few miles above, we had to track the canoe through.

Tracking Calls for Close Teamwork

In tracking, the sternman trudges the shore towing the canoe like a [illegible] barge mule. The [illegible] remains aboard to guide the craft past rocks and points. [illegible] long [illegible] to the [illegible]

[illegible] the [illegible] teamwork and coordination. Ralph [illegible] kept a weather eye [illegible] to see how the [illegible] coming along. A sudden [illegible] on the rope at the wrong moment might jerk one of the [illegible] into the water [illegible]



Hamilton River Drains a Pulpwood Reserve Unknown to the Woodsmen of Ax

[illegible]

[illegible] wind slapping against the bottom.

When tracking canoes, the Indians [illegible] the rope [illegible] their hands. But to drag the loaded canoes up plunging chutes, they find it [illegible] pull [illegible] out, the lines over their shoulders, leaning against them with all their strength. [illegible] even while [illegible] at rocks for extra purchase.

That first day on the Atikonak, drizzle soaked us. [illegible] the end we were [illegible] through [illegible] rapids. Then the river opened into a lake where a fierce wind drove spray over us.

By evening our teeth were chattering. As we landed on a willow-bordered shore, the drizzle turned into steady rain. Masters at [illegible] order out of desolation, John and Leslie promptly cut firewood and [illegible] for the fire.

Leslie split a [illegible] log four ways, unsheathed his knife, and from the dry centers cut shavings as thin as [illegible]. Even on sodden ground a single match set them aflame. He [illegible] and [illegible] until the crackling blaze [illegible] fiercely enough to ignite whole wet logs.

"[illegible] night [illegible]," said Leslie.

John placed the "kettle stick" over the fire and [illegible] water [illegible] tea. Each of us [illegible] as the fire's heat vaporized the moisture in our clothes. [illegible] spirits soared.

"Not such a bad place, after all," said John. Like a woods creature he had burrowed into a [illegible] place where the rain wouldn't [illegible].

Home, Home in the Bush!

"You're right in your element here, aren't you, old man?" Ross asked.

"There's nothing I like better than [illegible] in the bush," John answered, then started to sing to prove it.

"What's the name of that song?"

"Haven't got a name. The Trapper's Song, I guess. A couple of the boys made it up."

In [illegible] falsetto John began [illegible] Grand River [illegible] Hamilton.

[illegible] trappers,
We [illegible]
The [illegible]
In the [illegible] Fall
[illegible]
And [illegible]
[illegible]
With [illegible]

Six days out we reached the upper end of [illegible] and the [illegible] islands and capes were utterly confusing. The wind howled [illegible] in the heavy swells.

Andy took a compass reading and corrected for magnetic declination. With the help of our Canadian topographic map he chose a course to the south.

We [illegible] passed between two islands. No [illegible] opened through the [illegible]. Had the compass [illegible]? Was the map wrong? We [illegible] and turned northeast to [illegible] with the [illegible].

After miles of [illegible] searching for an [illegible] flowing river, we ran out of water at the head of a bay. No channel there! Next day we found the inlet of [illegible] stream [illegible] not two miles from where we had read the compass. Moral: If you won't believe your maps and compass, stay home.

In [illegible] Lake we [illegible] but two more [illegible] to the head of [illegible] Lake.

"[illegible]," [illegible] John [illegible]. The guides [illegible]."

Beyond [illegible] we knew [illegible] we were [illegible] down to Unknown Falls, though the exact [illegible] was [illegible]. But when we [illegible] the first [illegible] of Unknown River [illegible].

Few Eyes Have Seen Unknown Falls

Unknown Falls were not completely unknown, but even on latest maps Unknown River's course is only a dotted line.

Prior to [illegible] only three parties had fought their way to Unknown Falls. Each group saw one pair of falls and departed unaware that another existed.

A British expedition, led by the late H. G. Watkins, visited Unknown Falls in the winter of [illegible] and [illegible] both Upper and Lower Unknown Falls. Mountains of ice from frozen spray flanked the falls.

The next year Elliott Merrick, traveling with a Labrador trapper, [illegible] to all four falls. Between Merrick's [illegible] and the arrival of our National Geographic Society party in [illegible] but [illegible], as far as [illegible] knows, reached Unknown Falls. Even from the air these cataracts, as well as Grand Falls, have rarely been photographed.

Drifting down Unknown River, we were [illegible]. Below a heavy rapid [illegible] stream [illegible] the banks of a high hill [illegible] lake.

We [illegible] canoes and [illegible]

Hikers Perched on Beaubien Canyon's Brink Appear Lost in Labrador's Immensity

[illegible]

[illegible] vertical slope through incredibly tangled woods to the lower stream. The canyon [illegible] like a trap.

Ghastly wraiths of vapor marking Lake Wattaw [illegible] just beyond a [illegible] lake Wattaw has identified as Lake 1. The falls were twice that far off in the river's [illegible].

In the far distance the dense white "steam" of Upper Falls stood out like a snowbank against rolling green forest and purple hill.

Before leaving that [illegible] peak we [illegible] our names and the date in the latest [illegible] that [illegible]. Then we tumbled downhill to our canoes.

Two miles of paddling brought us to a pitch where [illegible] the dark water into white [illegible]. We made camp just below.

A [illegible] disappointed and [illegible]. The [illegible] the river had [illegible] a [illegible] level with our tent [illegible].

But it was water from the sky and the river, that drove us. That new waterproof tent had a rubberized floor to keep out moisture from chance puddles and rain-soaked grass. That [illegible] almost [illegible] well.

While most of the shelter proved water-tight to the weeping Canadian skies, Ross recommended the [illegible] cloth to drip on blankets and sleeping bags. It [illegible] the [illegible] in low spots on the [illegible] floor-cloth.

[illegible] many mornings the guides awoke [illegible] wrapping blankets about their hips and [illegible] in pools of water. All mattresses, which the guides had refused, held Kelly and Avis above dish water mark.

Modern Packing Allowed Varied Diet

The better the weather, the bigger our [illegible] and the more [illegible] our requests.

We did our [illegible] for the trip on the premise that a wilderness trip [illegible] being more than a [illegible] succession of [illegible] paddling, hard work, and perspiration. We wanted good food, but had to keep total weight down because of the canoes [illegible] capacity.

So our grub stores featured solid foods of high nutritive value. We stocked up liberally on canned meats—boned chicken, bacon, ham, Spam, corned beef, and tuna. There was plenty of water on general hunter—but not enough tea. We enjoyed jam in every hue, from cereal and [illegible] to crackers and cake.

Dates and figs, olives, pickles and [illegible] were [illegible]. We never [illegible] serve straight mashed potatoes (we just added our powdered [illegible] to hot milk or water) to [illegible] the [illegible]. Lunches [illegible] were [illegible] cake and vegetable soup [illegible], mixed either with ham or chicken.

For [illegible] we [illegible] meat and four [illegible]—pancake [illegible] and cake. Cake was [illegible] was [illegible] because the trip was half done.

We did not [illegible] from [illegible] [illegible]. From the supply of [illegible] [illegible] successfully made [illegible] cake, or [illegible] chewy bread [illegible] over [illegible] in [illegible] skillet [illegible].

Bitter [illegible] were [illegible] powdered whole milk and [illegible] [illegible] milk. Tea and powdered coffee [illegible] the list of staples.

Not far below Lake 1 past two [illegible] rapids we came into an expansive [illegible] whose foot [illegible] of vapor bring about [illegible] showers. There was the thunder of falling water. We had reached Upper Falls.

After lunch that [illegible] Friday, June 21 we set out about [illegible] to see the right bank [illegible] first the right Upper Falls and then the great Lower Falls.

Upper Cataract Resembles Victoria Falls

The massive Upper Cataract [illegible] suggested to me a lesser Victoria Falls. A half a mile upstream the river tumbled [illegible] over an escarpment [illegible] with some [illegible] nearly at right angles to the face of the [illegible] [illegible].

As island divides the cataract into [illegible] sections. The western [illegible] fall was the greater.

While [illegible] weather [illegible] we [illegible] the right bank of the [illegible] seeking the lower [illegible] of fall. Emerging [illegible], we saw the river sweep from the gorge, divide around an island and disappear. Two more wraiths of smoke hung in the river air.

A half hour later we stood in admiration of the right bank Lower Falls gorge [illegible] funneled into a single channel [illegible] [illegible] 1[illegible] feet straight and [illegible]. Spray followed up from the [illegible] swirling [illegible] dammed the eddies into which the stream [illegible] a mass of foam, surged down a [illegible] channel.

The air was full of mist. A hindrance to photographs, these airborne water droplets caused a rainbow that arches [illegible] the gorge (page 80).

That night we [illegible] into camp [illegible] after sunset. Hungry [illegible] of fish, [illegible] and vegetables from [illegible] stocks [illegible] our [illegible].

Next morning we [illegible] across the river to the western shore and [illegible] to the [illegible] and on to the Upper Falls [illegible].

Grassy Bluffs Overlooking the Gorge Just Below Niagara Falls, Preserve Its Beauty in Wilderness

A Forest Fire Cleared the Site of Burnt Creek, Burning Headquarters of a Subcamp from Bourazzi

Drillers Prone Be Lucky for Iron Ore Samples . . . A Field Map's Red Patches Indicate Major Deposits

[illegible]

Canoe Travelers Scour the Water Route Ahead. Evergreens Spread Across a Landscape Scraped by Ancient Glaciers

[illegible]

Captive Goose Struggles for Freedom . . . The Aluminum Cage Is Scratched but Not Fractured

With a Horse Short, Unknown River Leaps a 900-Foot Upside in Wild Descent from the Lafayette Plateau

[illegible]

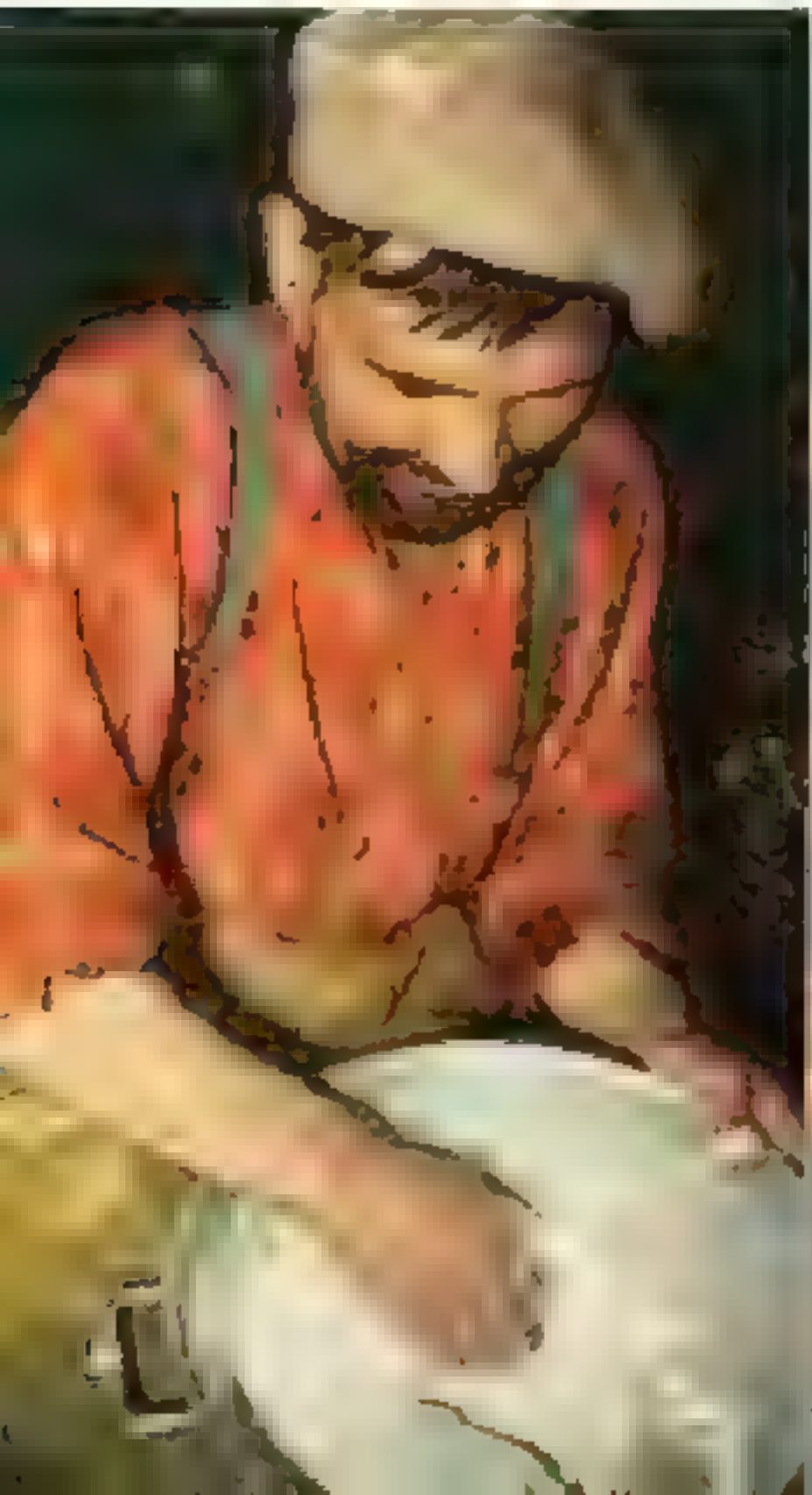
Gourmets For the Expedition's Food, Dry Dressed Clothing, and Thaw Chilled Travelers

[illegible]

Rainbow Dips in Misty Air into Lower Lakes on Falls' Awesome Canyon

"We'll Be Home Tomorrow"
Grades Get Shaved to Greet Waves

John Michelin, on Mondbeld Board, Knends "Hanneedrance"



Apparently Called a Halt for Lunch. *Frost and Lacey Nose onto Sundance Lake's Pebbly Shore*

[illegible]

Lone Leaps Down Whitecapped Mouni Rapids at Motorboat Speed. Fifty Miles a Day Was Easy Going

[illegible] Then *Lone* [illegible] in a whirlpool [illegible] for [illegible] Lone [illegible] the [illegible] [illegible] It seemed as if the [illegible] ships were [illegible] [illegible]

Manhandling a Canoe Up a Creek's Stony Irregular Bed Is a Slow-motion Job

Sun-Toasted Canoe Bottoms Smile in the Wash Like a Hot Iron

[illegible]

Portage Makes Outdoor Men Pay for the Wonders They Have Seen

[illegible]

Winokapau Lake, Impossible When Gales Lash Its 35-mile Length, Welcomes the Paddlers with a Glassy-smooth Face

Potato Gardener and Indian Bush in North West River, Sun

[illegible]

In North West River the Nonpareil Sold Gloucester to Labrador

[illegible]

of feeding [illegible]. Leaving [illegible] descended and reached the snowy line of the [illegible] lakes.

The sun still shone brightly as we headed downstream, crossing brooks and skirting across [illegible] lands.

Our map showed a tributary flowing into Unknown River from the west above the falls [illegible]. Anticipating that the stream might be too deep to wade, we had brought with us an axe and some rope to build a raft. We had not ever [illegible] across that rough country.

Sure enough, the tributary soon blocked our way. It was a moat between us and the [illegible] Unknown [illegible].

The stream pushed into Unknown River just above the crest of the falls. If [illegible] we [illegible] the main stream would have [illegible] before the raft [illegible] over the fall.

Raft River Imposes a Barrier

Fortunately, the tributary—which we called Raft River—flowed with [illegible] current through a good part of its length [illegible] into Unknown River.

John and Leslie cut six or eight dead trees and lashed the timber logs together.

"Looks O.K.," said Ralph. But when he and Leslie stepped aboard, the raft sank to the bottom. [illegible] another tier of logs.

We selected the head of the pool. [illegible] even 12-foot poles failed to reach bottom. Leslie, wearing our heavy wool [illegible], volunteered to stay behind. Ralph and Andy were determined to cross. John brought the camera with him.

Each cut two paddles. They were heavy, awkward, and narrow, but better than poles that wouldn't reach bottom.

Pushing off from the willow at the [illegible] we caught the current. At first the heavy raft scarcely responded to our paddle thrusts.

"Let's go back and start again," John [illegible], glancing at the approaching white crest of the rapids.

"We're all right now," Andy said, as the raft swirled heavily toward shore. We landed halfway down the pool.

It was a short walk to the [illegible] and lower falls. Here a mass of rock split the flood into two thunderous staircases. This one was more broken up than the other. The creamy spray of waters [illegible] with terrifying force through [illegible] it.

We returned to our improvised raft, stepped aboard and shoved off. Suddenly, one of John's legs dropped through the logs right up to his thigh.

"Paddle back!" he called out. "It's sinking. We'll go over the rapids!"

With a frantic [illegible] we retrieved [illegible] a moment later [illegible] slipped overboard. The raft was loosening and [illegible] with the [illegible] we began to [illegible] paddles and [illegible] and presently [illegible]. We [illegible].

Leslie hauled us [illegible].

With our [illegible] persistence paid off, [illegible]. We were the first, we were quite sure, ever to reach and photograph [illegible].

Below [illegible] Unknown [illegible] junction with Hamilton River below Grand Falls [illegible] (page 7[illegible]).

So we had to retrace our route to [illegible] Lake.

Stalking a Stag Caribou

We set forth and [illegible] against Unknown River to reach [illegible] Lake [illegible] just below the [illegible] John [illegible]. "Look there on the [illegible]. A caribou!"

A magnificent stag with a spreading rack of antlers was browsing on willows at the water's edge. John [illegible]. We [illegible] picture.

We were 50 yards from the caribou when [illegible] the [illegible] up the bank toward John and Andy. [illegible] the [illegible] and plunged into the [illegible].

The [illegible].

[illegible] Sandgirt.

[illegible] white water [illegible]. The [illegible] group of [illegible] river [illegible] right bank [illegible].

The river [illegible] at a [illegible] curve [illegible].

[illegible] John [illegible].

[illegible]

below submerged ones, [illegible] in place. We twisted through, facing each hazard as we met it. Responding to John's steering, *Loon* slipped past one rock on the left, barely grazed two more on the right.

A final sharp swirl at the bottom, and the rapid was behind us. *Trout* followed close on our heels. "A good run," observed Andy. John's face, now relaxed, was wreathed in smiles.

Sargent Lake Weds Hamilton's Two Branches

From Sargent Lake, meeting place of Hamilton River's Ashuanipi and Attikonak branches [illegible] to Grand Falls. *Loon* and *Trout* cruised through a [illegible], flowed [illegible] through the country.

On [illegible] Lake a loon, frightened, its wings outspread, skimming in on its breast like a seaplane making a perfect landing. Not half an hour later a real seaplane flew directly over us but gave no sign of seeing our canoes.

Gliding along that calm evening, we watched whitefish by the thousand breaking up all over the glassy water to feed on mayflies that dotted the surface like fleets of miniature sailboats.

[illegible] we flushed [illegible] of small flocks. Loons voiced their [illegible]. The country is an interesting [illegible] of many species of ducks.

Birds were [illegible] on the upper Hamilton. On the lakes of the [illegible] by [illegible]. Sometimes 20 or 30 of them, mewing like a procession of cats, went through their graceful aerial games overhead. Gulls, too, were [illegible].

Single geese and a few small flocks of the [illegible] flew over us. One [illegible] that on ground John could catch it (page 77). In dark woods we flushed flocks of spruce grouse. Often they [illegible] motionless on limbs as we brushed past.

Trappers, Born and Bred

By trade our guides were trappers. Our route from Sargent Lake down to [illegible] traversed the trapping grounds of these men and their friends who come inland from Lake Melville on the coast.

In the past 15 years more and more of the trappers' income has been earned as guides [illegible] prospecting parties, and by work at the war-built Goose Airport.

But talk of fur still lights [illegible] in their eyes. Fur has meant bread and [illegible] clothes for the baby and a new dress for the wife. [illegible] adventure.

In this part of Labrador [illegible] mink, [illegible] weasel, beaver, lynx, and bear. **Marten (high-quality Labrador** pelts often were sold as [illegible]) used to bring big money. Catching them is now prohibited by law.

A marten [illegible]. It is [illegible] the trapline till [illegible].

John and Leslie were constantly alert for signs of fur. A faint track, a nibbled twig, fluttering leaves, a worn place in the moss—nothing escaped them.

For 20 miles below Sargent Lake we skirted John's trapping grounds. On Trout Lake we pulled ashore to visit his [illegible] headquarters. [illegible] is the Labrador term for a log cabin. Most tilts are only [illegible] high and built for [illegible].

John's cabin had a rough-sawn door and a glass window over the low door. Against the rear wall was a mattress of spruce boughs. Four sticks rising from the floor supported the sheet-iron stove.

Fox and lynx traps hung on the walls. Stretching boards were stacked under the bunk. Colorful pages torn from magazines partially papered the walls.

Peeled Log Walls Are Bulletin Boards

As in all tilts, the peeled logs were closely scribbled with [illegible] messages of visiting trappers. "Dec. 16, 1945. Came here from [illegible]. Blowing and snowing all day. Dennis Best." "[illegible] Nov. 25, 1945. [illegible] Lonesome for the old woman [illegible]."

More than 40 tilts like John's are scattered along Hamilton River between [illegible] Lake and the mouth. [illegible] of smaller overnight [illegible] away among the hills and along lonely lake and stream shores.

Whenever we asked, "How far to a good camping place?" or "How many miles to the next tilt?" Leslie and John answered in terms of tilts or "spells."

"Oh, it's quite a piece yet, maybe two tilts." Or, "Not so far; about half a spell, I figure."

Tilts are about a day's snowshoeing [illegible] apart, and a day's travel is five or six spells, in the sense of distance between resting spots.

Spell also means a short pause or tea stop.

Trapping territories are [illegible]; John ex-

Trapline's Log Cabin Seems Built for Midgets; Men Must Bend Double to Enter

[illegible] Brown [illegible] St. [illegible] smaller ones, with [illegible] cheaper [illegible] in a day [illegible] [illegible] [illegible] and [illegible]

placed. No one with trappers' [illegible] area. The Indians know the white trappers' lines. White [illegible] set their traps elsewhere, mostly among the more remote lakes and streams.

Traplines pass from father to son or to another relative. There are no deeds to any of these lands. Yet one trapper [illegible] right of [illegible] a kind of squatter's rights.

Trappers Trek Inland in Early Fall

Early in the autumn the men set out by canoe for the trapping grounds. Each man heads inland two or three hundred [illegible] or [illegible] miles. They [illegible] carry [illegible] of [illegible] and [illegible] sugar and [illegible] — pounds and pounds [illegible] to [illegible] trapline [illegible].

Trapping begins in November, when animal pelts are thick and dark. The Labradorean [illegible] sticks to [illegible] until [illegible] in early January.

Bound for down, the trapper piles his furs on a long sled [illegible] sleeping bag, ax, and grub bag, and heads for home. He rarely uses dogs; the sled is designed for a man to pull.

Some men make a spring hunt from after New Year's until late March or early April.

The forest seemed [illegible] to see [illegible] in summer. As we skirted quiet shores, ripples [illegible] and [illegible] muskrats. We [illegible] only one mink and one [illegible] weasel.

A [illegible] is a peaceful part of [illegible], along [illegible]

Lukmann River, Cooling the Landscape, Leaps Lower Lukmann Falls in Four Cataracts

[illegible]

An Air View Delineates Rapids, Islands, and Trees with Needle-sharp Clarity

[illegible] Grand Canyon [illegible] Tuckaway [illegible] rapids [illegible] they [illegible] Lee Hanson.

down an Unknown River rapid. The short [illegible] portaged with [illegible] staring at each other's faces and whiskers.

The [illegible] of the rapid water just below. Superb swimmers, they are largely of arrow-swift trout and other [illegible] fish. Some brook trout we caught had raw, healed or partly healed scars that our guides attributed to otter wounds. Other runs of [illegible] were common above Grand Lake.

The Gateway to Grand Falls

Hamilton River's strong tide bore us swiftly toward Grand Falls.

When the going was easy, Ralph often broke the silence with lively song. That day, [illegible] toward Lobstick Lake, Andy joined Ralph in a lusty chorus.

The fest was abruptly cut short when the current brought the two canoes into [illegible]. Soon we were at Lobstick Lake, at the head of the Hamilton. [illegible] to reach its [illegible]. From Grand Lake we would [illegible] to Lobstick [illegible] route that bypasses the impassable stretch of river.

Many of the [illegible] on the Hamilton River were named by A. P. Low, Canadian geologist. His [illegible] that crisscrossed the Labrador-Quebec peninsula in the [illegible] of the last century still are valuable references.

We left most of our outfit on an island at the outlet of [illegible] Lake. From the [illegible] stream to Bad Rapids [illegible] (page 91). Below, rapids were [illegible].

Carrying tent, sleeping bags, and food for three days, we trudged out along the right bank. The [illegible] walk to the falls proved [illegible] with [illegible] spruce thickets.

A [illegible] above the [illegible] rapids [illegible] (page 99). On a [illegible] above that [illegible] we set up camp (page 78).

"[illegible] Camp," Andy suggested.

"Why?"

Leslie [illegible], "Before a fall, you know!"

Ralph [illegible] shook his head, muttering, "Poor Andy [illegible] at last!" But all of us were very proud and pleased to be there.

In the [illegible] morning we walked through mist-drenched forest to the green [illegible] opposite the falls. This vantage gave a [illegible] view of [illegible] (page 73).

[illegible] resembling [illegible] the river [illegible] pouring to [illegible]. Swinging 75 degrees [illegible] into Bowdoin Canyon (page 7[illegible]).

John [illegible] hours [illegible]. Yet [illegible] who [illegible] their lives amid [illegible]. They were [illegible] at [illegible] face with that incomparable sight.

In rapids just above the falls the Hamilton drops 200 feet. The falls are 245 feet high. [illegible] through Bowdoin Canyon, the river plunges another 370 feet. In [illegible] miles the [illegible] 1,038 feet, one of the [illegible] of any major river on earth. And the Hamilton here is a [illegible] volume river.

We spent two days at Grand Falls, [illegible]. Mist [illegible] from the towering vapor column [illegible] camera lenses protected them until he [illegible] pressing the trigger.

Rainbows [illegible] the [illegible]. The [illegible] of the setting sun [illegible] first pink, then [illegible] long after the forest had turned to [illegible] and the river to [illegible] pewter.

Glory of Falls Still Unsullied

Reluctantly we turned [illegible]. We were grateful, though, to have seen the [illegible] state. [illegible] to [illegible] the silver glory of Grand Falls, to [illegible] trees that crowd about it, or [illegible] towers, [illegible] or formal [illegible].

The region is isolated, but not [illegible] of the larger waters. With [illegible] the railroad from the Gulf of St. Lawrence to the new [illegible] area, the Grand Falls [illegible] will [illegible] to visit.

[illegible] the camp beside Earl Bakke's [illegible], John and Andy went fishing in a big [illegible]. They caught 23 brook trout and [illegible] salmon [illegible] from two to three and a half pounds, a welcome fresh-food addition to the [illegible].

[illegible] Ralph and Leslie [illegible] trees in whatever direction they chose.

At [illegible] found a dry spruce [illegible] behind the tent. He chopped at the [illegible] with [illegible] from the tent. Andy [illegible] supper preparations and noticed that the tree had a [illegible] the tent.

"Hey, John!" he called. "Won't that fall the wrong way?"

John smiled and turned his ax to finish the job. [illegible] sharp crack, and the tree toppled in a direction opposite from what John intended, missing the tent by inches.

John looked sheepish, but not for long. These men never make enough mistakes to disturb the assurance upon which their lives depend.

For the next few days we had to pay for all the weather we had seen. The Big Hill portage [illegible] miles of [illegible] ponds and brooks, and [illegible] miles of backpacking on the portage trail.

Between [illegible] we [illegible] packs [illegible] loads [illegible] with gear.

"How long is this carry?" Ralph asked Leslie as we wearily stepped out on yet another swampy shore.

"About half an hour," Leslie answered.

There were [illegible] minute [illegible] and some half-hour carries. The guides [illegible] with [illegible] of [illegible].

The [illegible] portage, however, [illegible] called "Big Hill," was too long to measure in minutes of [illegible]. It was [illegible] five miles long [illegible]. The last half mile dropped 700 feet to the [illegible] shore, in some places [illegible] slope.

[illegible] Big Hill was [illegible] to test [illegible] with [illegible] on your neck. Fires had burned off all vegetation [illegible]. The [illegible] pebbles and boulders [illegible] sand and gravel needed only a nudge to start sliding to the river.

Mosquitoes and Black Flies—by the Pound

[illegible] in August. [illegible] were welcome [illegible] plague of black flies. Mosquitoes had been [illegible] during the [illegible] weeks, [illegible] black flies were [illegible]. No [illegible] crack or tight [illegible] to [illegible] clothing escaped their [illegible] attentions.

[illegible] had white [illegible], and [illegible] with white [illegible]. [illegible] legs [illegible] wrists [illegible] to relieve weight of [illegible] and neck. [illegible] fresh [illegible] flies.

When breezes blew, the [illegible] was [illegible]. The [illegible] let us alone [illegible]. [illegible] relentless attacks [illegible] from Ralph the [illegible]. "What [illegible] did they do [illegible] we came along?"

[illegible] and [illegible] of rock [illegible] along as if we were [illegible] of [illegible].

[illegible] followed [illegible] on the portage. We [illegible] and rested. More [illegible] sealed [illegible].

That evening we [illegible] the [illegible] in [illegible] light. [illegible] green [illegible] and yellow [illegible] around the rock [illegible].

Lower River Gives a Last Ride

It is [illegible] miles by the river from the Big Hill to the mouth. [illegible] the stream [illegible] we [illegible] the distance in four [illegible]. One day we made 70 miles.

Our first [illegible] on the lower Hamilton [illegible] what the natives call it, Grand River. A [illegible] of [illegible] forested [illegible] hills often [illegible] 1,000 feet or more [illegible].

[illegible] with wooded slopes. Streams [illegible] the [illegible] with white [illegible]. [illegible] with [illegible] evergreens.

A delight of the [illegible] was the pure, cold river water. We drank it [illegible]. [illegible] almost colorless. [illegible] paddle or [illegible] the water [illegible] stained [illegible] opaque and dark as the [illegible] of all [illegible].

[illegible] miles below the Big Hill the Hamilton entered Winokapau Lake, a [illegible] of water [illegible] long [illegible] is [illegible] deep. [illegible] soundings [illegible] 425 feet.

As we [illegible] the [illegible] was [illegible] by [illegible] water [illegible] simply [illegible].

[illegible] below Winokapau the [illegible] Rapids [illegible] us [illegible] 12 miles down the [illegible] in [illegible] than [illegible]. [illegible] water [illegible] we had only to keep [illegible] and [illegible] the [illegible] to steady the canoe [illegible].

We whizzed past [illegible] and [illegible] [illegible] speed! A [illegible] in the [illegible] and [illegible] the stern [illegible].

A Modern White Bloodhound Hunters Toward Grand Falls with Relentless Power

Far Past Grand Falls, the Hamilton River Moves Mirror Smooth. Trees Paint a Perfect Image

[illegible]

The Devil's Hole is a famous danger spot in the [illegible], where whirlpools form and vanish between [illegible] and upsurge. John thought the [illegible] might make it through.

Ralph and Leslie had been left a mile or two behind when Andy and John slammed into the Devil's Hole. John looked over the [illegible] deep at the heart of the pool and headed the canoe into the [illegible] current.

But the eddy at that water stage was stronger than John thought. [illegible] dragged by [illegible] was swept into the [illegible] of the [illegible]. As bad luck would have it, the [illegible] of two small whirlpools [illegible] into a single [illegible]. The little craft [illegible].

Whirlpool Nearly Sucks In a [illegible]

First the bow was down, with water overlapping the gunwales. The canoe swirled twice. Then the bow lifted free and the stern slid into the [illegible].

Andy turned to John for orders. The canoe was three-quarters flooded. It seemed as if [illegible] must go. John had laid his paddle across the gunwales and grinned with [illegible] of [illegible]. [illegible]

"Paddle! Paddle!" John shouted.

[illegible] the whirling eddy [illegible] as [illegible] as it [illegible]. [illegible] to be dry [illegible] right [illegible] crew [illegible] start [illegible].

John [illegible] in for a stroke. Andy unbuttoned his collar.

"For a minute I thought we were goners," John said, and let out a deep breath.

As we turned down the last of the [illegible], Leslie's quick eyes caught the glare of tents along the shore. It was an Indian camp.

With smiles and a score of [illegible] words, [illegible], head of the family, welcomed us. John, who speaks their language, interpreted.

[illegible], his wife and three children reached the Hamilton from the south with no tea, no sugar and only a handful of flour. [illegible] they had been in the bush continuously for a full year. His wife reclined at ease [illegible] puffing a pipe.

At a word from [illegible], his oldest boy [illegible] with a large sack. From it he extracted what looked like [illegible] rags, [illegible]. It was [illegible] meat, [illegible] to chew and very tasty. [illegible] John and Leslie [illegible].

We left what food we could spare with [illegible] and set sail again.

Next day we drifted through the Slack Waters. The [illegible] were [illegible] to see.

In Hamilton [illegible] high [illegible] into the ice-filled Labrador [illegible] the [illegible] regions of startling vegetative contrast. Those who think [illegible] Labrador with the [illegible] would be astonished to [illegible] the [illegible] grown 200 miles [illegible] the Hamilton. These splendid spruces and [illegible] in [illegible] with [illegible] of [illegible] and [illegible] poplars.

Below the Slack Waters the hills drew in. The loud [illegible] of the [illegible] Rapid, one of the roughest on the river, swelled and [illegible] on the air.

Here, where trappers have [illegible] a [illegible] trail, the Hamilton narrows to [illegible] yards and roars around a turn [illegible]. The [illegible] along the [illegible] of the bend — [illegible] around [illegible] curve.

Instead of [illegible] rush in midstream, we [illegible] the shore and [illegible] through. [illegible] and Andy [illegible] over a [illegible] and [illegible] into the safety of an eddy.

Down a Foaming Staircase

Then Leslie and Ralph came [illegible] down [illegible] and [illegible] the [illegible] of white water. They [illegible] seized [illegible] waiting [illegible] to splash [illegible] stern.

The stream [illegible] down [illegible] the hills. The current was swift [illegible] dangers. In the Horseshoe Rapids we had to [illegible] through [illegible] swells to hold the safe channel.

At Gull Island Rapid John and Leslie thought they could let down their canoe [illegible] tracking line without portaging. First hazard was a pair of big boulders with water rushing [illegible] in a spout not quite wide enough to float our [illegible] craft [illegible].

It took a lot of "heave-ho!" and [illegible] to [illegible] the canoe over the obstacles.

John jumped from rock to rock like a [illegible] hauling back on the [illegible] line taut as a fiddle string.

Momentarily out of control, [illegible] leaped a chute, [illegible] in the [illegible]. The [illegible] craft smashed the [illegible] so hard that [illegible] flew to either side, and the [illegible] of the [illegible] itself in the water. We had to [illegible] to empty [illegible] gallons of [illegible] river.

Muskrat Falls was the last obstacle. There the river dropped two chutes, each 25 feet. The portage was over a [illegible] sand bank.

Five days below Muskrat Falls we [illegible] to [illegible]. Herbert [illegible] and [illegible] John and Leslie

Muscles Are Weary, the Weather Is Foul, but Isn't Supper Grand!

A [illegible] the [illegible] [illegible] [illegible] the camper's [illegible] cooking [illegible] (page 83).

were cutting timbers for power poles at Goose Airport. We persuaded them to [illegible]. They [illegible] [illegible] trade [illegible].

War's Echoes Dimly Heard

Out of reach of all news for five weeks, we were eager to catch up on the strife in Korea.

"What's the news?" Keith and Andy [illegible]. "Is the war over?"

"Oh, we don't hear [illegible]," [illegible] answered. [illegible] He turned to Andy. [illegible] river [illegible].

We lingered 40 miles [illegible] of the Hamilton and crossed Lake Melville to the village of North West River (page 88). [illegible] across water without [illegible] of wind."

We reached the [illegible] village [illegible] at 10 o'clock on the evening of [illegible]. We [illegible] in the dark [illegible] looked at each other with a [illegible] of respect. The adventure was over.

Next day, [illegible] and stiff, we [illegible] on [illegible] and [illegible] with friendly [illegible]. We strolled among the gardens of the Grenfell mission and helped pick potatoes, peas, and carrots for our dinner (page 87). [illegible] lanes and walkways [illegible].

From the town soccer field we climbed Sunday Hill to watch the sun set over Grand Lake. [illegible]

Spain's Silkworm Gut

By Luis Marden

WHEN Don Quixote, Spain's mad hero, started his knightly adventures, he and Sancho Panza were riding along a road in La Mancha.*

"After they had gone a couple of miles," Cervantes wrote, "Don Quixote caught sight of what appeared to be a great throng of people, who, as was afterward learned, were certain merchants of Toledo on their way to Murcia to purchase silk."

In 1605, Don Quixote's publication date, Murcia was Spain's [illegible] for natural silk. It took [illegible] to establish [illegible] unusual silk product: silkworm gut.

A Discovery by Ragpickers

The story goes that more than a century ago a Murcian [illegible] silkworms on a [illegible]. Strolling ragpickers, curious to examine the silk-spinning creatures, tore one open. Experimenting, they stretched [illegible] into long threads of tough, transparent silk. So was a new industry born.

Since that time Murcia has supplied the world with this filament. Some 25 plants, making gut and fishing equipment, [illegible] Murcia in competition with Redditch, England's famed tackle town.

In peak times Spain turns out [illegible] strands of gut a year. Lately, artificial substitutes have reduced gut exports sharply.

Fishermen who say "I caught it on gut" [illegible] for connections between lines and lures (page [illegible]). Surgeons, favoring the remarkable strength, use it to sew wounds.

Both anglers and doctors once used horsehair. Some English fishermen still prefer white horsehair, and [illegible] surgeons occasionally sew with horsehair sutures.

But just as the silkworm took the place of the horse, so nylon, product of the laboratory, now pushes the silkworm into the background. In [illegible] fashion, nylon [illegible].

Moth Undergoes Three Transformations

Bombyx mori, the silkworm moth, has a four-stage life cycle: egg, larva, pupa, and imago or mature moth.†

In the thread-silk industry, growers kill the insect at its cocoon or pupal stage. Then they unwind the cocoon's thread and spin the filaments into raw silk.

Gut makers, eliminating the cocoon stage, stop development one step earlier. As the worms begin to spin their [illegible], they are killed and cured in an acid solution. Then the two silk glands are removed and stretched into filaments (page [illegible]).

Gut making is women's work. Murcia [illegible] silkworm eggs [illegible] until spring. [illegible] in March they [illegible].

Most growers [illegible] the worms between [illegible], but some [illegible] between [illegible]. Now the Spanish Government is [illegible].

When the [illegible] they [illegible] mulberry leaves [illegible] (page [illegible]).

Finally, in [illegible], the worms, now grown to three inches, stop eating and prepare to spin cocoons. At this point [illegible] they are [illegible] into the [illegible] bath.

Each Murcian family has its own formula for the pickling. Some use beer and water, others vinegar and water or vinegar and salt. [illegible]

Chickens Snap Up the Leavings

[illegible] (page [illegible]). [illegible] she [illegible]. Now, with one swift movement, she pulls the two [illegible] to their full length, 8 to 16 inches. When [illegible] filaments, [illegible] (page [illegible]). Finally the gut is dried in the sun (page [illegible]).

[illegible]

The breaking strength of most gut varies between 2 and [illegible] pounds. [illegible]. Some of the finest [illegible].

[illegible] Expert anglers prefer gut. It becomes supple in the water [illegible].

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*See [illegible] of Spain," by Luis Marden, National Geographic Magazine, April [illegible].

†See [illegible], by William Joseph Showalter, National Geographic Magazine, July [illegible].

Señorita Gomb Golden "Wigs" of Silken Gold, Spain's Gift to Ireland and Surrey

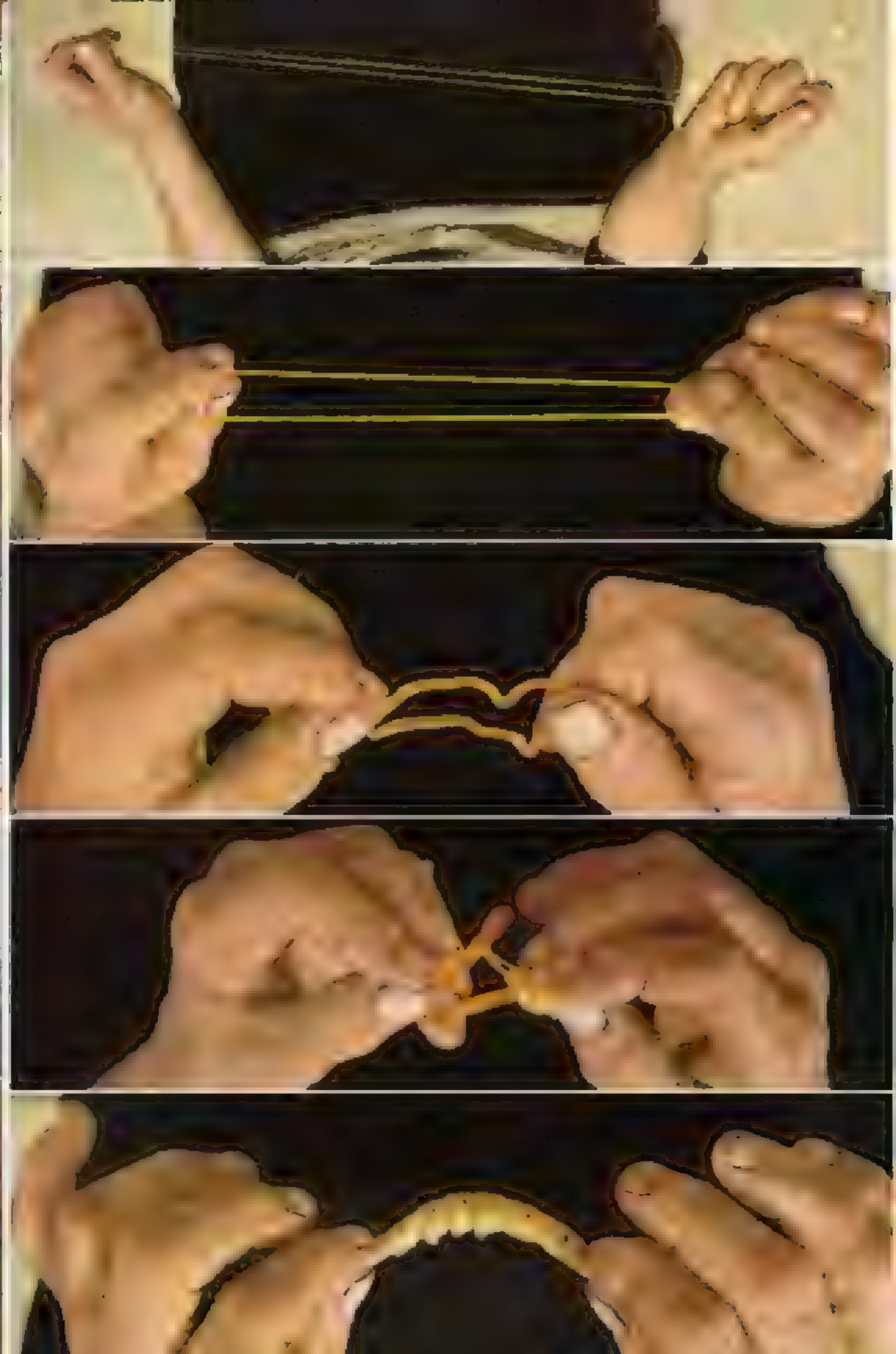
A Silk Moth's Life, from Squirmy Caterpillar to Peanut-shaped Cocoon, Is a Glutton's Banquet of Mulberry Leaves

[illegible]

A Sericulturist Demonstrating with a Large Model, Points Out the Tiny Silk Sacs, Source of Gut

Worn-cracked Hands Stretch Sebs Glands for Anglers and Doctors

[illegible]



From Lowly Worm to Comes Spotted Beauty. Drawn and Wasted Filaments Die in the Spanish Sun

36,000 Strands of Gut Represent the Lifework of 38,000 Worms

[illegible]

Fishermen Use 70 Percent of Gut; Surgeons Take the Remainder

[illegible]

Versatile Wood Waits on Man

By Vernon H. Brown

[illegible]

[illegible]

[illegible]

A Mammoth Sequoia, Perhaps 2,000 Years Old, Joins the Nation's Lumber Pile

[illegible]

A Branchless Forest Trains Pole Climbers: Spikes Wear Out the Timbers in a Month

[illegible] at Francis E. Warren Air Force Base, Cheyenne, Wyoming. [illegible]

"Have you any Charlie McCarthy down there?" she asked. "He must be history's most [illegible] piece of wood."

The story of trees was [illegible] when man was new. [illegible] possible.

Nearly [illegible] equipped with the [illegible] and [illegible] most [illegible] of the most famous wooden vessel ever launched. [illegible] fell [illegible] her [illegible] crew [illegible] the walls [illegible] timbers [illegible] first [illegible] —the "Constitution," shaped of wood (page 115).

Tree [illegible] were the first [illegible] wheels [illegible] spinning wheel. Wood [illegible] made spinning possible.

Wooden ships carried men to [illegible] of the Seven Seas. The first cargoes the Virginia Company [illegible] carried back from the New World to England were [illegible] and pitch and [illegible]. Our [illegible] were [illegible] schooners built of wood.

American forests [illegible] enriched America.

One Douglas fir [illegible] computed that enough saw timber grows in the U. S. every [illegible] to build a new home. Yet in productive forests we rank only fourth, after Russia, Brazil, and Canada. The U. S. S. R. boasts timber resources [illegible] as vast as those of the United States and Canada combined.

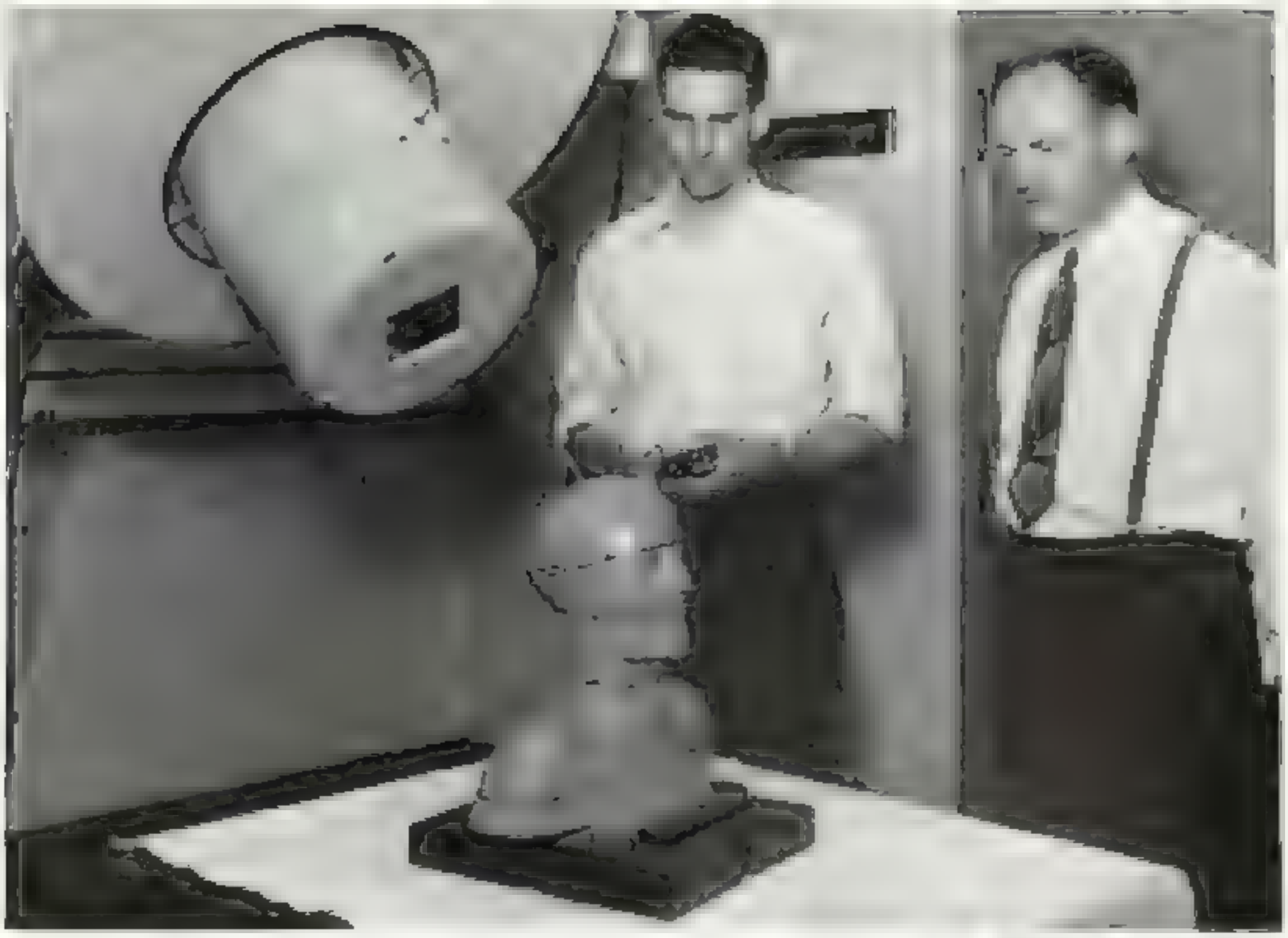
Wood a Mighty War Weapon

In World War II our [illegible] leaned on wood [illegible] Other [illegible]

For the armed forces American industry [illegible] several wood [illegible] from rifle stocks to [illegible] planes [illegible] to the [illegible]

The [illegible] Corporation of [illegible], Massachusetts, [illegible] management, [illegible] wood to the British. They shaped it into propellers for combat planes.

Side by side with the Navy's steel vessels fought hundreds of wooden [illegible] ers. PT boats [illegible]



Block-headed "Mr. Cruikshank" Plays a Brainy Role in Cranial X-rays

[illegible] Mr. Cruikshank [illegible] Navy [illegible] Navy [illegible] Massachusetts Institute of Technology [illegible]

boats, [illegible] chains, and many more. Our "two-ocean" Navy [illegible] wooden ships.

Besides, [illegible] 125,000 board feet of oak to [illegible] carrier. (A board foot is a piece of lumber one foot long, one foot wide, and one inch thick.) The flight deck of every big [illegible] carrier was [illegible] with two and a half inches of edge-grain Douglas fir three inches thick.

Wood Boosted Ersatz Output

Shortages [illegible] Germany to make all possible use of wood. Hitler's legions ate [illegible] sweetened with wood sugar and ersatz [illegible] which [illegible] laboratory [illegible] from wood [illegible].

Germany used [illegible] wood [illegible] fodder. Sausages [illegible] length, and [illegible] sprinkled [illegible].

[illegible] derived from wood. [illegible] wood clothing.

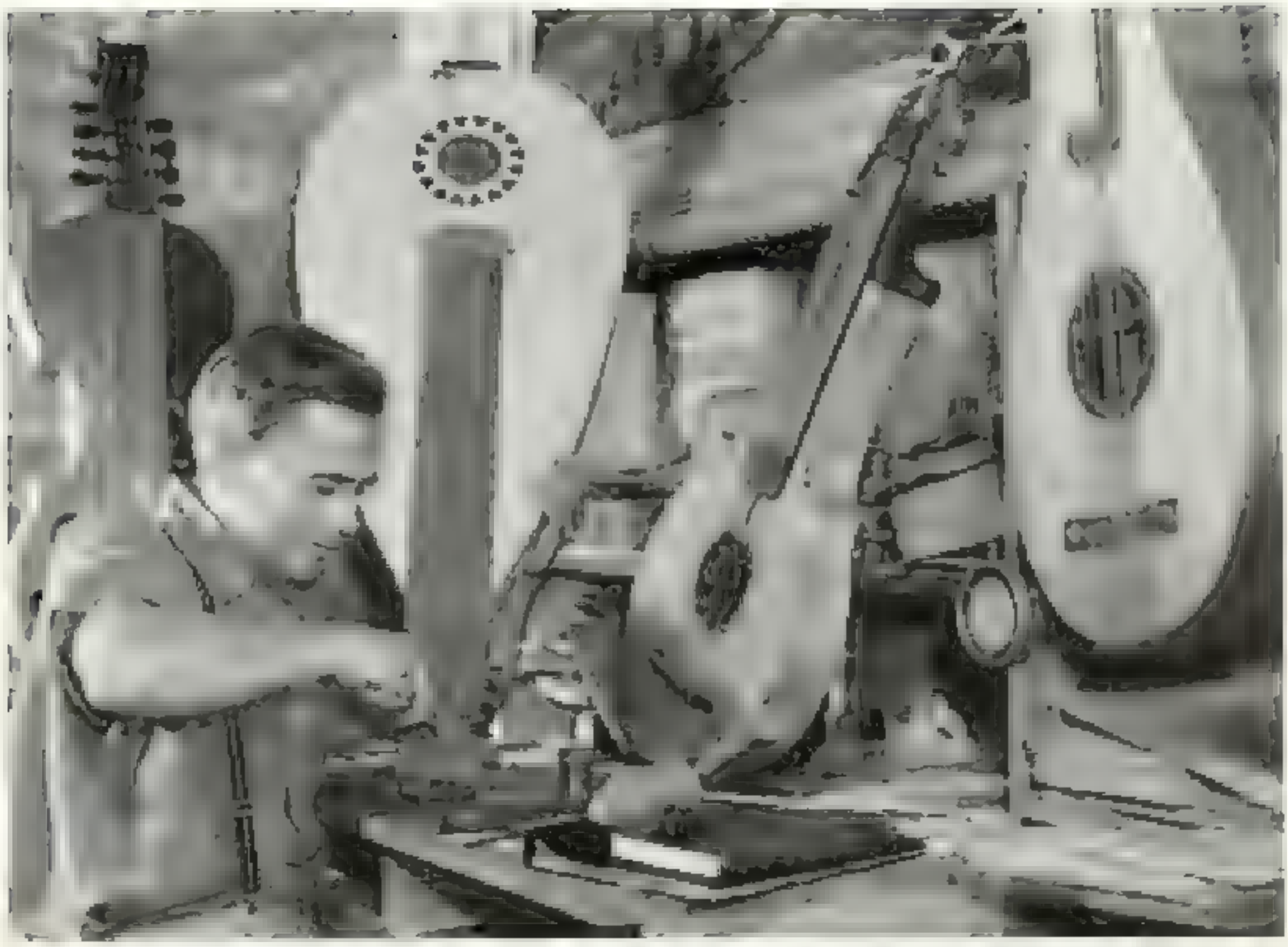
The [illegible] wood [illegible] of wood [illegible]. But [illegible] colleges, and private research plants [illegible] wood through endless [illegible] new [illegible] service.

Leading [illegible] U.S. [illegible] Department of Agriculture's Forest Products Laboratory at Madison, Wisconsin. There I saw, [illegible] wood [illegible] legs and planes [illegible] wood [illegible] and [illegible].

I [illegible] workshop where [illegible] sawed, [illegible] wood to test its [illegible].

In [illegible] I [illegible] wooden [illegible]. Within [illegible] building [illegible] with [illegible], doors, [illegible], and [illegible].

At [illegible] "Bridge" [illegible] in the [illegible] house [illegible] with [illegible] instruments and [illegible] devices [illegible]. [illegible] had been placed within.



National Geographic [illegible]

A Kentucky Folk Song Virtuoso Tunes Up His Homemade Dulcimers

The [illegible] [illegible] Lad Nix [illegible] makes and plays [illegible] [illegible]

After window panes cracked and doors failed through the [illegible] [illegible] properly [illegible] [illegible] were studying combustion temperatures [illegible] strings and [illegible] made from wood.

This was just one of hundreds of tests under way that day in the Forest Products Laboratory, [illegible] in the world.

Wood "Has Everything"

What are the qualities of wood that make it such a treasure?

Wood is made up of countless tiny tubes of cellulose, bound together and impregnated with lignin, "nature's glue." This structure [illegible] strength, [illegible]

Parallel to the grain, wood's resistance and tensile strength are phenomenal. Think of the bearing of a flying board! Wood [illegible] slowly, and resists weather, like few other organic materials.

Yet wood shows amazing resistance to [illegible] with the [illegible] exposed to [illegible] [illegible] Wood [illegible] pleasing [illegible] to the eye.

That's not all! Unlike conducting metals, glass, and stone, wood is warm to the touch, a poor conductor. Many species have pleasant perfumes.

Wood is [illegible] and [illegible] and is easy to work. It takes stains, paints, and other finishes smoothly.

Several dense woods sink like stones in water. By contrast, feather-light balsa floats like a cork. Yet it's strong enough to use in life-[illegible] and model airplanes. Balsa allows [illegible] to lift [illegible] weights [illegible]

Best of the [illegible] things of all about wood [illegible] abundant, and it is a renewable resource. Some useful kind of tree will grow [illegible] all but regions of climatic extremes.

United States Is a Wood Workshop

[illegible] shifting [illegible] United States [illegible] wood workshop.

[illegible] wealth of oak and maple, [illegible] white pine and spruce in New England, New York, the [illegible] States, and the southern Appalachians. They built [illegible] furniture, [illegible] industries,

Pioneers, who sought yellow metal, discovered "green gold" in the Northwest and northern California. Today we count heavily on these living riches: our virgin stands of quality softwoods—Douglas fir, ponderosa pine, redwood, western hemlock, white fir, sugar pine, and western red cedar.

These superb species, together with southern yellow pine, form our chief reservoir of construction lumber. Wood sawed from two average Douglas firs will build a typical American home.

Much Maine and Minnesota spruce and fir, and the South's young fast-growing pines are unsuitable for long timber. They serve newsprint, kraft, bag and wrapping papers, paperboards, and wallboard or hard-board products.

Trees of the South, seldom thought of as a great forest region, supply 47 percent of the Nation's pulpwood and 37 percent of its lumber, reports the American Forest Products Industries, Washington, D. C.

The timber industries contribute 13 to 15 billion dollars annually to the national income.

Turning out wood and wood-derived items worth this fabulous sum are about 60,000 sawmills. Though a scant three percent of them produce more than half our lumber, [illegible] veneer and plywood plants, [illegible] pulp mills, and many specialty [illegible].

In 1950 a record-smashing building boom gripped the United States. Home construction outstripped all past performance with 1,396,000 new dwelling units started, including some 700,000 frame houses. And four out of five [illegible] built of wood.

Housing and building by industry consume about half the United States' saw-timber cut, which is running about 35 billion board feet annually. Builders ordered boards, beams, and trim stock for everything from shingles [illegible] to fence [illegible]. [illegible] for roof trusses of [illegible], gymnasiums, warehouses, hangars, [illegible].

The [illegible] for lumber has given new life to portable sawmills [illegible] "peckerwood" [illegible] mills.

Homes from the Assembly Line

Postwar demand for low-cost houses has spurred prefabrication and mass production. You can purchase lumber today and, with good luck, move into your new house a month or so later. Houses [illegible] assembly-line basis.

Almost 300 U. S. manufacturers in 1950 turned out some 55,000 prefabricated homes—largely of wood; the 1951 total is [illegible].

Gunnison Homes of New Albany, Indiana, a leading prefab maker, has geared its conveyor-belt production line to turn out a complete house every 20 minutes and some [illegible] every month. They ship the various house components in packages for assembly on the site.

When you write out your down-payment check, you possess a finished dwelling, complete to sidewalks, drives, landscaping, even flowers in the window boxes.

Though coal and gas now threaten, even today the third largest use of our timber supply is for fuel. Yes, between a quarter and a fifth of the [illegible] wood [illegible] goes up in flames (page [illegible]).

Even a modern metropolis like New York City hasn't eliminated open fires. New Yorkers still watch flames flicker in [illegible] fireplaces. Two of these, both on the 80th floor of the Empire State Building, are the world's highest [illegible] above street level.

Logs Hold Up Wires, Rails, and Mine Roofs

Across our land millions of trees have lost life and limb yet still stand straight [illegible] living forest. These are the [illegible] million telephone, telegraph, and electric power poles that play follow-the-leader up and down the 48 States. Crews erect [illegible] new ones every year.

Railroads buy a major portion of the Nation's wood products and rely heavily on wood to do their job.

Hurtling along at 85 miles an hour, the New York Central Railroad's crack 20th Century [illegible] Empire State [illegible] past 3,250 wood ties and 36 wood telegraph poles every minute. Spanning [illegible] of America [illegible] over rails [illegible] more than [illegible] wooden crossties.

Although steel and concrete [illegible] are gradually replacing wood in mines, a huge quantity still is used for pit props, shoring timbers, track ties, and other mine work.

In certain items the wood industry can match the Federal Budget in astronomical figures. [illegible] many [illegible] Americans use each year, to [illegible] to keep the Canasta score, and figure on the income tax?

The answer is one-and-a-half billion—more than 17 pencils apiece for every person in the United States! A line [illegible] with that staggering number of pencils would reach to the sun and back 283 times.

Six-sided or round, most pencils are shaped halves of glued wood gripping the graphite and clay "lead." [illegible] from the sharpener

Trojan Horse, Antiquity's Wooden Booby Trap, Accomplished the Fall of Troy

For ten years [illegible] the Greeks laid siege to Troy. [illegible] built a horse [illegible] filled it with [illegible] and left it outside the city walls. [illegible]

they smell; in part because they're almost all made of aromatic cedar.

The average burner cedar from western California yields 37,000 pencils—[illegible] gross.

Eastern red cedar, mostly from Tennessee, once provided the bulk of our pencil wood. As it grew scarce, pencil people turned the countryside, buying up worn cedar fences, rails, well sweeps, anything made of cedar. Then the western incense cedar came in to save the day.

The limited supply of eastern cedar still is sought for high-quality drawing pencils.

Tennessee cedar [illegible] because [illegible] saws are [illegible]. [illegible] pencil rather [illegible] the western wood in the [illegible] stock.

Western Wood recently has [illegible] new material for one of our smallest necessities, the [illegible] friction match.

[illegible] Priest and Pend Oreille Rivers [illegible] Diamond Match Company form at the place where pine logs that yield "splints" for the match.

Newsprint is the leading product of all [illegible] pulp. [illegible] wooden [illegible] anywhere [illegible] paper machines

The consumer of [illegible] products [illegible] [illegible] percent of the total. [illegible] 485 [illegible] of all kinds. [illegible] three out of every five [illegible]

In other [illegible] and [illegible] like [illegible] principal products, among them [illegible] pressers, [illegible] and spoons for cream and [illegible] pins and toothpicks.

Bleachers Put the "See" in Ceremony

Americans don't [illegible]. Wood is the [illegible]

For the 1949 inaugural parade of President Truman workmen erected [illegible] platforms and [illegible] seating [illegible] twenty-six [illegible] from the Capitol to the White House. They needed [illegible] million board feet of lumber for [illegible] use. Builders who purchased the [illegible] enough to erect nearly 85 [illegible] houses.

Inauguration stands [illegible] old timbers of the White House, now undergoing renovation. Contractors have found [illegible]

White House beams dating from reconstruction after the 1814 fire, in surprisingly good condition.

The [illegible] White House has sheltered, among others, an [illegible] President who turned [illegible] to wood. He earned the "Rugged" [illegible] a wooden [illegible] for [illegible] he split rails and [illegible]

In country towns of America [illegible] wheelwrights were key men in local economy. [illegible] wagons needed wheels, and [illegible] a [illegible] barrel for shipping flour, sugar, pickles, or nails.

Today the turning of wooden wheels is almost a vanished skill, except for country folks' buggy wheels, [illegible] wagons, and some farm vehicles. And parts are [illegible]

The cooper's craft has also yielded to specialization. Barrel assembly plants line the staves and heading along some 400 small [illegible] mills.

[illegible] the United States last year made about [illegible] and slack barrels (used to store and transport solids). [illegible] barrels [illegible] For [illegible] Tennessee, and other [illegible] barrels daily.

First Saboteur a Shoe Tosser

Many country folk in Europe still wear wooden shoes, called sabots in France and the Low Countries. By one account, the first saboteur was a discontented French worker who tossed his sabot into machinery to cause damage. Another explanation draws a parallel between the clumsiness of walking in wooden shoes and the willful carelessness of saboteurs. [illegible]

[illegible] instead of leather, [illegible] shoes [illegible] shaped [illegible] lasts [illegible]

[illegible] patterns [illegible] lasts [illegible] Americans. [illegible]

[illegible] women's shoes are [illegible] dates in this country. Oscar Nystad of Portland, Oregon, still does a good business in wood-soled shoes.

Employees of cheese factories, ice plants, and in other work where underfooting is damp find the footwear best for [illegible] on two counts: they're good insulators, and [illegible] through the soles.

"[illegible] Northwest [illegible] provide the biggest market," Mr. Nystad told me. "Most of the [illegible]"

Though wood shoes [illegible] American women walk on wood heels, except for [illegible] styles and [illegible] Wood [illegible] the same tree that yields maple sugar.

First Wood Heels Raised Wearers Above Mud

[illegible] wood heels originally were intended to elevate the wearers' feet above mud and [illegible] streets. In Marie Antoinette's day, both ladies and their [illegible] wore high wood heels; in general, the higher their station, the higher were their heels.

About 50 [illegible] turned out the millions of wood heels that give American women their high standing in the world.

[illegible] Civil War [illegible] wagon [illegible] grease [illegible] Northern [illegible]

[illegible] Company [illegible] contract for supplying the [illegible] North with [illegible] founded in 17[illegible] [illegible] wooden toys.

In [illegible] Merry Christmas wooden toys [illegible]

Wood is ideal for toys. [illegible] Wood [illegible] except [illegible]

"Keep your hands off the wood and [illegible]

[illegible] and work [illegible]

Idaho Loggers Battle a River

A Burly Lumberjack on Nimble Feet "Hops the Toothpicks" in a Clearwater River Jam

[illegible]

Bunkhouse and Kitchen Two Up on the Shore
Art House to the Men

[illegible]

Bobbing Islands of White Pine Clog the Surging Clearwater

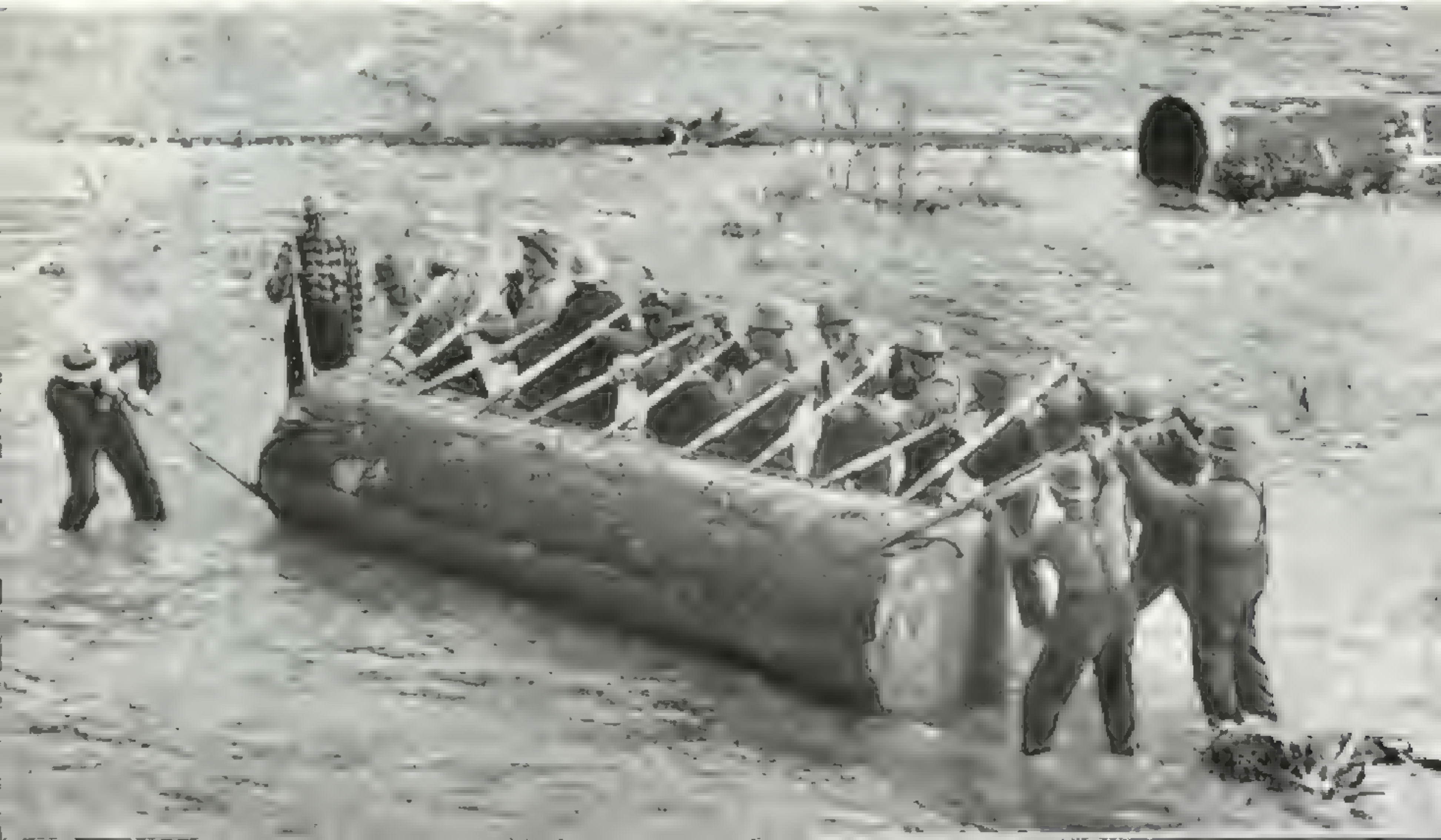
Log Drivers Commute from Camp to Jams by Motor Launch

[illegible]

Lumberjacks Stop a Jam Pry Tangled Logs with Peaveys

Off She Goes! Jacks Shove a Jammed Log into the Current

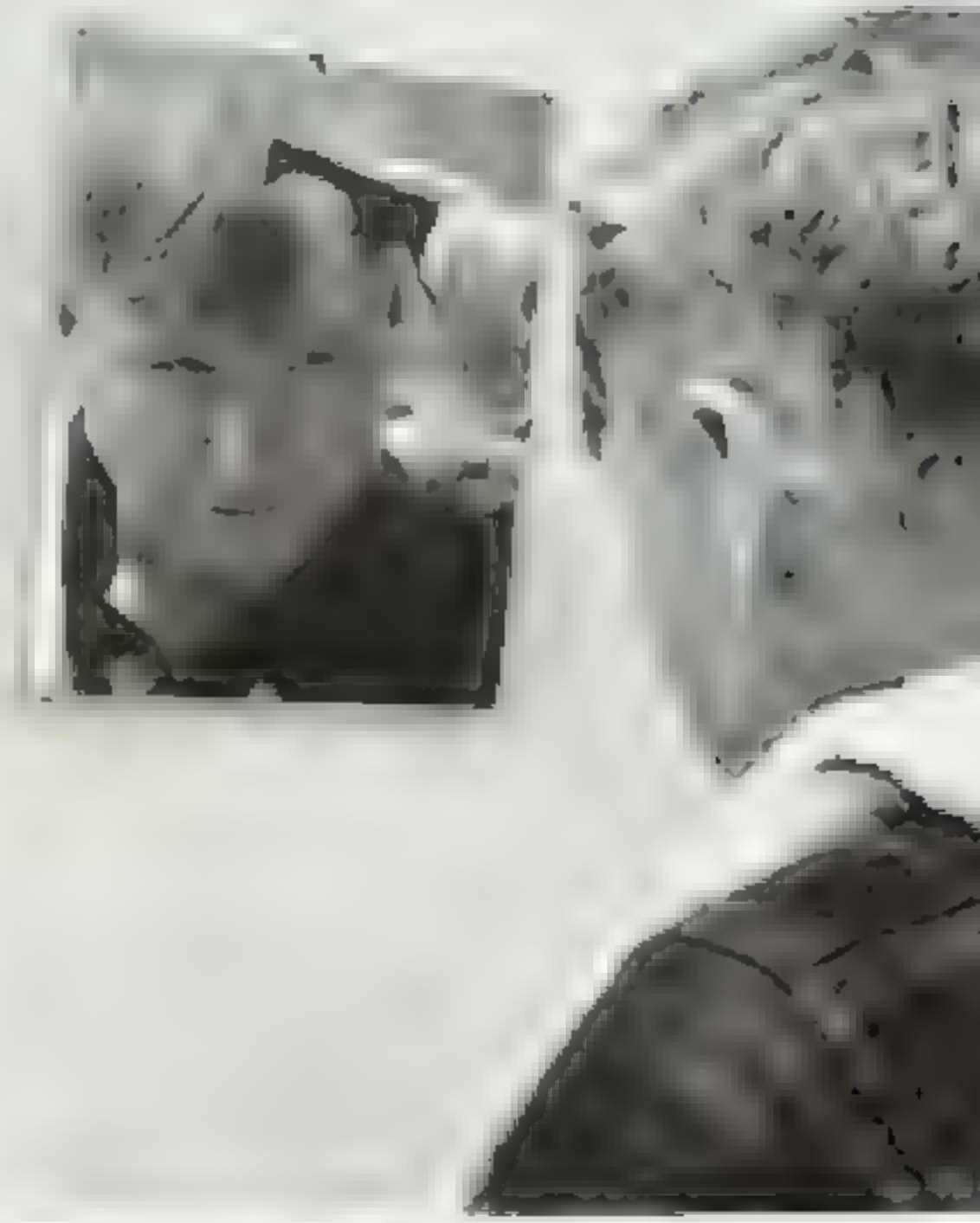
The Follow-up Crew—Six Men, Ankle-deep in Snow-cold Water, Grapples a Beached Log with Peaveys



A Dynamite Blast Shatters the Key Log Anchor of the Jam

Weekend Logs Fly Apart in a Fountain of Spray and Splinters

[illegible]



Laundress Washed Up for Glass

[illegible]

Hungry Lazers Meet Hunting Pirates in the Breakfast Table

[illegible]

"Have a Dip!" Buddies Share a Snuffbox

[illegible]

Tom Salutes His Boots with a Horsewater Rinse

[illegible]

Razor-sharp Boot Calks Command Their Owners Loving Care

[illegible]

Square Pegs in Round Holes Hold a Bunkhouse Raft Together

[illegible]

Lunch Finished, Gramma's Relax; To Sleep or Toss In the Quicksand

[illegible]

Wholesome Food Pleasures and Wants: What Lumberjack Wants More?

[illegible]

the woods of varied sorts for the piano.

"Apart from the cast iron frame, wood still is the most essential of piano parts," Mr. Henry Z. Steinway, vice-president of Steinway & Sons, told me. "Total tension on a piano's strings amounts to 18 to 20 tons, and wood in combination with steel is employed so as to solve problems of hard usage.

"Our sounding boards are made from spruce," Mr. Steinway explained. "We've patented a diaphragmatic sound-board tapering from less than a third of an inch at the center to less than a fifth of an inch at the edges. This shaping allows the sounding board to vibrate as a whole and thus give more tone.

"We build [illegible] pianos [illegible] made [illegible]. All our parts, such as [illegible], are [illegible] of hardwood [illegible]. The [illegible] without [illegible] of our instruments."

During the late war Steinway made [illegible] hundreds of wooden wings for troop-carrying gliders. At the same time, the firm managed to produce about 2,500 [illegible] pianos—some of them were played for [illegible] audiences in big [illegible].

Even since [illegible] the Drum and [illegible] wood has been favorite for musical instruments. [illegible]

The National Symphony Orchestra of Washington, D.C., typical major orchestra, normally plays 75 wooden instruments. All the string sections—violins, violas, cellos, and contrabasses—are of wood. Maple and spruce, aged from 25 to 40 years, are preferred for their construction. [illegible] are [illegible] of [illegible].

The [illegible] wood winds [illegible] English horn, and bassoons are made of [illegible] wood, [illegible] Arthur [illegible].

The [illegible] of metal, the saxophones [illegible].

[illegible] have [illegible] mahogany [illegible] the [illegible].

Sports Equipment Takes a Beating

Whether you [illegible] play baseball, tennis, golf, hockey, or croquet, wood [illegible] game. [illegible]

Sporting goods [illegible], [illegible]," [illegible] Mr. Tyson of A. G. Spalding & Bros., Inc. "The problem is to make equipment that will hold its shape and live a long time.

"Laminated rackets were built [illegible] Early rackets were [illegible] from a single piece of ash, hickory, or oak. Spalding [illegible] frames [illegible] laminations of ash.

"When a powerful tennis player hits a service ball, his racket may bend as much as two and a half inches. Spalding [illegible] the [illegible] service strokes from [illegible] frame to handle.

"In Spalding's [illegible] testing," Mr. Tyson told me, "we [illegible] at a very high speed. A special testing [illegible] that hit [illegible] in exactly the right spot as it reaches the top of the arc.

"The [illegible] of this [illegible] is 20 percent harder than the most [illegible]. One hour [illegible] is roughly equal to a season of hard court use. We've [illegible] with better [illegible] without injury."

Bats Gave the "Bang" to Baseball

One summer afternoon in 1884, Bud Hillerich, a young wood turner playing hooky from his father's shop, went to watch a baseball game in the Louisville, Kentucky, ball park. A great [illegible], the home team's slugger, Pete Browning, broke his favorite bat.

Young Bud persuaded Browning to go to his father's plant and let the youth try to make a replacement bat. Wielding the new bat [illegible], Browning got [illegible] for three [illegible] and the Hillerichs were in the bat business.

Today the name Hillerich & Bradsby, maker of the famous Louisville Slugger baseball bats, [illegible] the [illegible] of America's national game. H & B's [illegible] address [illegible] "The Bat Man" [illegible] "The Bat People."

When Honus Wagner in 1905 agreed to use his signature on Louisville Slugger bats, it was the first of a long line of baseball greats' [illegible] to appear on H & B's [illegible].

"Every [illegible] in [illegible] baseball [illegible] Louisville Slugger," Jack McGrath of H & B told me. "We [illegible] bats to the personal [illegible] of every great star of the past 50 or 60 years. Babe Ruth [illegible] one [illegible] 21 [illegible] and another 20 [illegible] with [illegible]."

Hillerich & Bradsby [illegible] leads the world in baseball and softball bat production. In 1951 the firm turned out more than three million [illegible]. H & B [illegible] and [illegible] popularity.

[illegible]

Don't Take Any Wooden Nickels? She's Happy to Do So

[illegible] New York [illegible] wooden [illegible] [illegible] [illegible] [illegible]

As [illegible] worth [illegible] fishing tackle [illegible] [illegible] U. S. [illegible] [illegible] [illegible] wood [illegible].

The [illegible] [illegible] [illegible] [illegible] [illegible] Toward [illegible] a Chinese [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] carvings.

[illegible] 1,[illegible] wooden [illegible] last year.

Ski and Crutch Leadership Is Coincidental

Outdoor Americans [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] The [illegible] [illegible] [illegible] from north-central United States. All ski-making countries [illegible] for [illegible] trade.

The New Hampshire State Planning and Development Commission, [illegible] of [illegible] their State [illegible] declared [illegible] between [illegible] New Hampshire [illegible] and 124 New Hampshire [illegible] of the United States' [illegible] of wooden [illegible].

Wood [illegible] of [illegible] [illegible] serves [illegible] while [illegible].

Intricate and ponderous steel structures that carry the huge weight of our [illegible] [illegible] their [illegible] to [illegible]. Some [illegible] and [illegible] as well as shipyards and [illegible] wood [illegible] for [illegible], [illegible] and [illegible]. These are as [illegible] to the [illegible] as [illegible] is to a [illegible].

At the U. S. Naval Gun Factory in Washington, [illegible] E. C. Lynch [illegible] around [illegible] makers [illegible]. I [illegible] wood [illegible] of the wood [illegible] from which [illegible] are made for [illegible] from [illegible] [illegible].

Mr. Lynch showed me [illegible] [illegible] like [illegible] [illegible] metal. [illegible] that [illegible] [illegible].

[illegible] [illegible] [illegible] [illegible] the [illegible] all over America." Mr. Lynch showed [illegible] wood carving from which [illegible] [illegible] [illegible] in the

[illegible] from [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

crash of the battleship [illegible] to [illegible] the dangerous [illegible].

Wood has a [illegible] in [illegible], where it [illegible] steel, bronze, and other metals.

[illegible] of America's [illegible] from lignum vitae, [illegible] At the other end of the scale, [illegible] wood serves [illegible] bearings in steel rolling mills. Shipbuilders use lignum vitae for strut bearings to steady propeller shafts [illegible]. Since the bearings of lignum vitae are "soft" [illegible], their vibrations are less likely to be picked up by the [illegible] than those in metal bearings.

Lignum vitae will [illegible] a wide range of [illegible] bearings. Most wood bearings, however, are now made from northern [illegible] simple [illegible] impregnated with oil.

[illegible]

Toy Furniture Is Assembled Through the Magnifying Glass

Workers in wood [illegible] New York, [illegible]

A man with an artificial leg [illegible] the handicap because a self-lubricating wood bearing in the knee [illegible] of its [illegible]. Dynamite makers guard against explosions by placing wood bearings in rollers supporting belts carrying the inflammable ingredients. [illegible] handling [illegible] chemicals, and other products susceptible to contamination [illegible] self-oiled bearings.

Wood bearings have functioned without attention for as long as 35 years.

Life Without Paper? Unthinkable!

Paper is [illegible] civilization. Some 95 percent of paper is made from wood.

The paper these words are printed on started life as trees growing in the [illegible] of New England and eastern Canada. The logs were transformed into the bright, white sheets that contribute so much to the appearance of your NATIONAL GEOGRAPHIC MAGAZINE at the Champion-International Company mill in Lawrence, Massachusetts.

Our paper towels, napkins, and disposable tissues have their origin in the forest. [illegible] papers are our [illegible] of life's [illegible]. [illegible] wood make our [illegible]. They [illegible] books, [illegible] houses, bonds and [illegible], [illegible] and deeds.

Paper carries the printed word that instructs, informs, and entertains all of us. More than 12,000 U.S. newspapers annually consume about [illegible] million tons of newsprint

Thirsty Cellulose Sponges Can Sop Up Water 20 Times Their Weight

[illegible] Buffalo, New York, plant.

[illegible] and pamphlets, with news and ads by the square inch.

Every year we print half a [illegible] three and a third per citizen.

An early product of the [illegible], however, was a concession to [illegible] Boston [illegible] nearly 75 million paper col[illegible] in a single year.

Each American man, woman, and child has annually, on the average, consumed more than twice his own weight in paper and paperboard.

Almost half our paper output goes into paperboard. A single company, Container Corporation of America, shipped [illegible] tons of paper and paperboard containers and cartons in 1952. CCA leads the paper packaging field.

Wooden boxes, crates, and baskets, however, still [illegible] place [illegible] for carrying a large volume of [illegible] fruits, apples, tomatoes, and winter vegetables. Stouter types hold everything from [illegible] to heavy machinery and aircraft engines.

Plywood "Unreeled" from Big Logs

Lumber, [illegible] ranks plywood [illegible] the top five consumers of wood in the United States. Layers of wood glued together with the grain of adjacent veneers at right angles give great strength to light, easy-to-handle sheets.

Plywood excels for furniture, cabinets, partitioning, doors, boats, railroad cars, and [illegible]. From display panels to jigsaw puzzles, [illegible] and toys.

Huge virgin [illegible] of our Pacific Northwest, especially Douglas fir, pro

while the finest plywood "peeler" logs. Thousands of feet of veneer "unreel" from a single log for lathe [illegible] knives. Workers cut and dry the veneer sheets, then glue and hot-press them together, usually in odd-numbered groups of plies—three, five, seven.

Electrical engineers have contributed a radio-heat principle for setting glue. In this so-called "high-frequency gluing," an electric current passes between electrodes embedded in each face of a press. Almost instantaneously the current heats the glue line and [illegible] surfaces—the plies of veneer that make up plywood, for example.

Areas of uncured glue [illegible] in cheaper plywood cannot occur, for the electricity reaches every molecule of the adhesive.

As choice peeler logs—the trees, three or four feet in diameter—grow fewer, laminated panel cores and synthetic plywoods may cope with the dwindling supply. The U.S. Plywood Corp. is preparing a huge "repertoire" of solid-wood and wood-and-metal products with a three-ply name, Novaply, with [illegible] layer with faces of bonded shavings.

Fine furniture exploits to the full the beauty of wood grain. Purchasers so often demand "the natural wood appearance" because it's instinctive in most of us to enjoy wood for wood's sake.

[illegible]

Wood Flattens Ball with a 2,800-pound Blow

Driven golf ball at the instant of impact [illegible] by the high-speed stroboscopic flash. [illegible] 1/7,000 [illegible] wood [illegible]

Rich Veneers, Furniture's "Make-up"

Furniture makers stress veneer for chests of drawers, tables, cabinets—pieces displaying broad, clear areas of wood. With expert care they apply thin sheets of beautifully patterned wood to exposed surfaces of sturdy, but less costly, core stock.

Veneers yield that "rich look" not only to furniture but also to radio, record-player, and television sets. The Radio Corporation of America, for instance, in 1950 used 25,000,000 square feet of veneers in RCA radio and television cabinets.

A tropical wood, mahogany, and a domestic species, American walnut, compete for top honors as volume cabinet woods for both solid and veneering uses. Other tropical woods grow increasingly popular, but the total of all these newer exotic species combined do not approach the quantities of walnut and mahogany used.

Choice veneering woods, with dense and curling "picture-making" figures, have brought eye-stopping prices. Exceptional mahogany logs have sold for as much as [illegible]; walnut stumps for [illegible]. Such veneering specimens, of course, are as scarce as early issues of the National Geographic.

"Despite its long journey from tropical forests, mahogany is not only the most widely used but also the least expensive of major cabinet woods, imported or domestic," said George N. Lamb, secretary of the Mahogany Association, Inc. "Four-fifths of mahogany veneer sells for less than [illegible] cents a square foot. Not exactly a 'jewelry' wood, is it?"

Philadelphia Uncorks, Not Revolutionary War Cannon, but the Wooden Mains

[illegible]

Three-quarters of all home-owned furniture is made of wood, most of it hardwood, the [illegible] from that in inexpensive furniture models and their homes in winter. Operations [illegible] for solid pieces of furniture. Workers often apply [illegible] and maintain [illegible] stock.

"Grand Rapids" Means Quality Furniture

In the trade, "Grand Rapids" quality means high-grade furniture, wherever made. Grand Rapids, Michigan has [illegible], of course, not [illegible] with furniture.

But [illegible] makers [illegible] in the industry [illegible] from New York, Chicago, and Los Angeles: Hickory, North Carolina; Rockford, Illinois; Evansville, Indiana; Jamestown, New York; Lexington, Mississippi; and Sumner, Washington.

In Washington, D. C., [illegible] the [illegible] of the Forest Engineering Company, a commercial wood products testing firm affiliated with the National Lumber Manufacturers Association. Joe Sheppard of FEC's research staff was at his [illegible] talking [illegible] about the laboratory's current projects.

Sheppard usually held down a Grade 10 cigarette on his gleaming [illegible] to pick up a [illegible] bowling pin.

"Which [illegible] cigarette [illegible], "[illegible] burn your desk [illegible]?"

"No [illegible]," Mr. Sheppard calmly stated. "[illegible] a sheet of aluminum foil [illegible] under the wood veneer of the desk top. The aluminum carries the [illegible] heat away so fast from the burning cigarette [illegible] the wood never gets hot enough even to [illegible]."

One of several office furniture makers now featuring these TFEC-developed desk tops is the Myrtle Desk Company of High Point, North Carolina. Flies sent down with desk-top samples at their December [illegible] to have the heat-drawing aluminum sheet as close as possible to the surface. A burning [illegible] vanish [illegible] off the pad.

When the cigarette [illegible] burns down wood and cellulose and begins to be released

An Operator Guides the Master Machine; Robots Simultaneously Copy Its Work

[illegible]

fine raw materials. Wood is approximately one half cellulose and one half lignin.

Lignin provides tannins and vanillin, and hydrogenated lignin is used to form oil-soluble lignin. Lignin also is a base for lamp waterproof powders. The stuff is used in rocket fuel, in [illegible] electrical equipment, in dyes and [illegible] inks.

From Cellulose Come Rayon, Foam Sponges

Vastly more important are the products of cellulose. Cotton linters alone are a source of the cellulose used in manufacturing raw materials for fabrics, for example, cotton comes from trees. Hemlocks of the Northwest yield about 3 percent of wood cellulose, a crucial resource.

Lignin has major uses, including treatment of cellulose chemically to provide a sticky liquid that goes into the sizing of paper, [illegible] and [illegible]. There are filaments, films and bandages made of rayon, one of our finest textile fibers. Cellulose also is the raw material of cellulose and vulcanized fiber products.

Mills weave rayon into all kinds of fabrics, from dress goods and underclothing to carpets, silk material and cord to strengthen automobiles. Three-fourths of the cellulose used in rayon fibers now comes from wood pulp.

Photographic film, slides and [illegible] cellulose provide [illegible] and [illegible] cellulose nitrate. Cellulose also is a base for plastics, including well-known celluloid.

Cellophane, [illegible], and [illegible] are made from cellulose. [illegible], [illegible] the same time [illegible] from [illegible], [illegible] species are [illegible] other [illegible].

Wood [illegible] from Pacific Northwest & Company of Wilmington, Delaware, uses chemical qualities of cellulose as a raw material in its manufacturing operations.

Six [illegible] departments make more than a dozen products based on the versatile material. [illegible] the [illegible].

Cellulose enters into [illegible], detergents and [illegible] for textiles, paper, [illegible]

* See "Chemical Making New Wonders for Farm, Home, Industry," National Geographic Magazine, November [illegible].

Using No Pigments, a North Carolina Artist "Paints" Portraits with Wood Chips

[illegible]

[illegible] provides the world of [illegible] photographic paper, synthetic power cell plates, cellulose sponges, and [illegible] (page [illegible]).

"Waste" a Challenge to Wood Users

Appreciation of wood as made our people [illegible] [illegible] years we wasted or [illegible] of [illegible] of well over [illegible] billion cords of wood, much of it burned as fuel or left in [illegible] (page [illegible]).

About half this appalling loss occurs in the woods and [illegible] in producing. Every single saw [illegible] from 30 to 25 percent of the wood in sawed [illegible] each [illegible] from [illegible].

The U. S. Forest Service states that only 45 percent of all the wood harvested yearly in this country [illegible] more valuable products other than [illegible]. Even [illegible] burned as fuel [illegible] much of the irreparable waste in wood [illegible].

Limits are perhaps [illegible] used at all.

Yet in developing the know-how to achieve total utilization of wood, men already have [illegible] the [illegible] of using all the [illegible] [illegible] can now see at the tree [illegible] the small [illegible] of [illegible] [illegible] (page [illegible]).

George M. [illegible], [illegible] of the Forest Products Laboratory, showed me [illegible] quarts edge-glued [illegible] from small stuff. He [illegible] such stock from scraps [illegible] high prices [illegible].

Laboratory [illegible] looked toward the day when [illegible] may no longer be available in [illegible] quantities.

Mr. [illegible] pointed [illegible] and [illegible] to [illegible] [illegible], and so forth — a raw material.

Exploded Chips Yield Dense Panel

Pioneer in hardboard from wood chips was the Masonite Corporation. In the Masonite explosion process [illegible] subject wood chips to steam under pressure.

When they release the pressure, the chips literally explode into fiber. Compressed under heat, the pulpable substance becomes [illegible] and [illegible] adjusted to

A Million and a Quarter Matches an Hour Flow from These Blocks

[illegible]

are number of industrial uses in home and industry.

Minnesota's current plant at Laurel, Mississippi, will raise out for more hardboard than any other single factory in the world.

The Puget Sound Pulp & Timber Co. of Bellingham, Washington was among the first to make alcohol on a commercial basis from pulp mill waste liquors. The two distilleries processing these million gallons of pulp mill alcohol every year from Black Liquor's [illegible] through sewers.

Weyerhaeuser Shows the Way

America's largest single forest products firm, the Weyerhaeuser Timber Company, with headquarters at Tacoma, Washington. The company seal bears the wise motto, "Forest is a Crop."

Weyerhaeuser's saw-, box-, and pulp mills cut Washington and Oregon. At Longview, Washington, they [illegible] have [illegible] plant.

Weyerhaeuser saws thousands of cords of lumber from sky-scraping western softwoods [illegible] in their forests. But the company has invested fortunes to develop ways and means of using not only the clear boards of big-saw logs, but every scrap of wood carried out of the forest.

Leftovers and by-products from one mill frequently become raw materials for another.

The company pocket, for example, a flood of products from Douglas fir bark, the "waste" 12 percent of a log. They market the bark under the name Silvacon, as a plywood glue extender and as an ingredient in insecticides, plastics, and [illegible].

Silvacon blended with [illegible] leaves a powdered flooring almost as tough as [illegible] or rubber. It takes a slick polish like terrazzo.

In a House Fear Just Initiative Weyerhaeuser's clever specialists also recover [illegible] ends of their Longview sulphite mill. They have [illegible] these waste liquors to give power to run the mill. Then they convert what from the boiler tubes to charcoals [illegible] over again to [illegible] the chips that would [illegible] waste that [illegible] to leave the [illegible] that makes the [illegible] that . . .]

Off with Sandals, Oxfords, On with Wooden Shoes! It's Tulip Time in Holland, Michigan

[illegible]

Round and round goes the wheel of progress.

Since the recent war, wood has proved a pivotal part in restoring normal relations between countries. Millions of board feet of North American lumber are helping rebuild Europe.

A heart-warming story of wood's role in making friends across the ocean concerns two formal sets that swept points of Southern Ohio years and 4,500 miles apart.

On August 10, 1925, a stark tornado devastated Little Rock, in the Netherlands. Generous gifts from the United States helped rebuild the town's two furniture plants.

A generation later, on January 3, 1942, a big black cloud with a red funnel leveled the sawmill town of Warren, Arkansas. The tornado wiped out 300 homes and scattered the large Bradley Lumber Company mill.

Word of the disaster reached Holland, Ohio, Dutch, revered by Americans still in the tough days of 1942, hurried to give so serious a blow to the town known Warren.

Merchants and farmers contributed flour, eggs, sugar, butter and other ingredients from which housewives baked thousands of cookies and doughnuts. Volunteers made the dishes as fast as they could be sent. Entertainers raised additional funds.

The proceeds paid for 40 black oak armchairs, four conference tables, four round top tables, a hand-carved chest and a chandelier, all from Dutch Holland.

On behalf of the people of the Dutch town, Netherlands Minister [illegible] presented the gifts to Warren, Arkansas, on December 8, 1942.

NATIONAL GEOGRAPHIC SOCIETY

GEOGRAPHIC ADMINISTRATION BUILDING
SIXTEENTH AND M STREETS NORTHWEST, WASHINGTON, D. C.

DuMont television... the standard of comparison

[illegible]

[illegible]

[illegible]

[illegible]

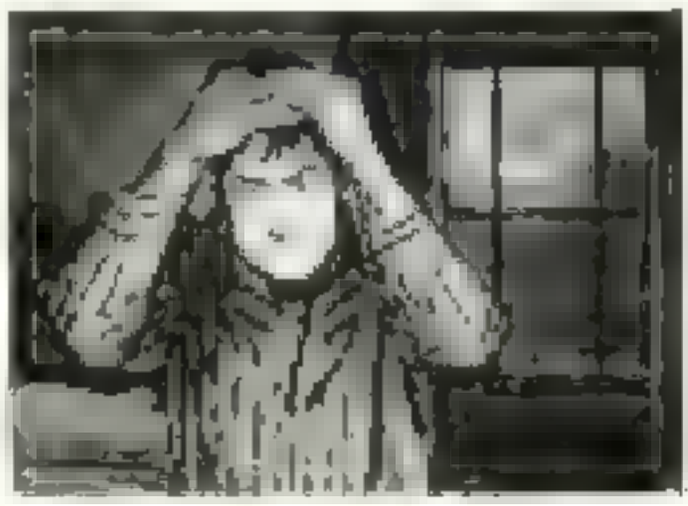
[illegible]

DUMONT

[illegible]

Has his old man been hitting the coffee again?

1. Nervous father [illegible]



2. Frequently [illegible]

3. What's to be done? [illegible]

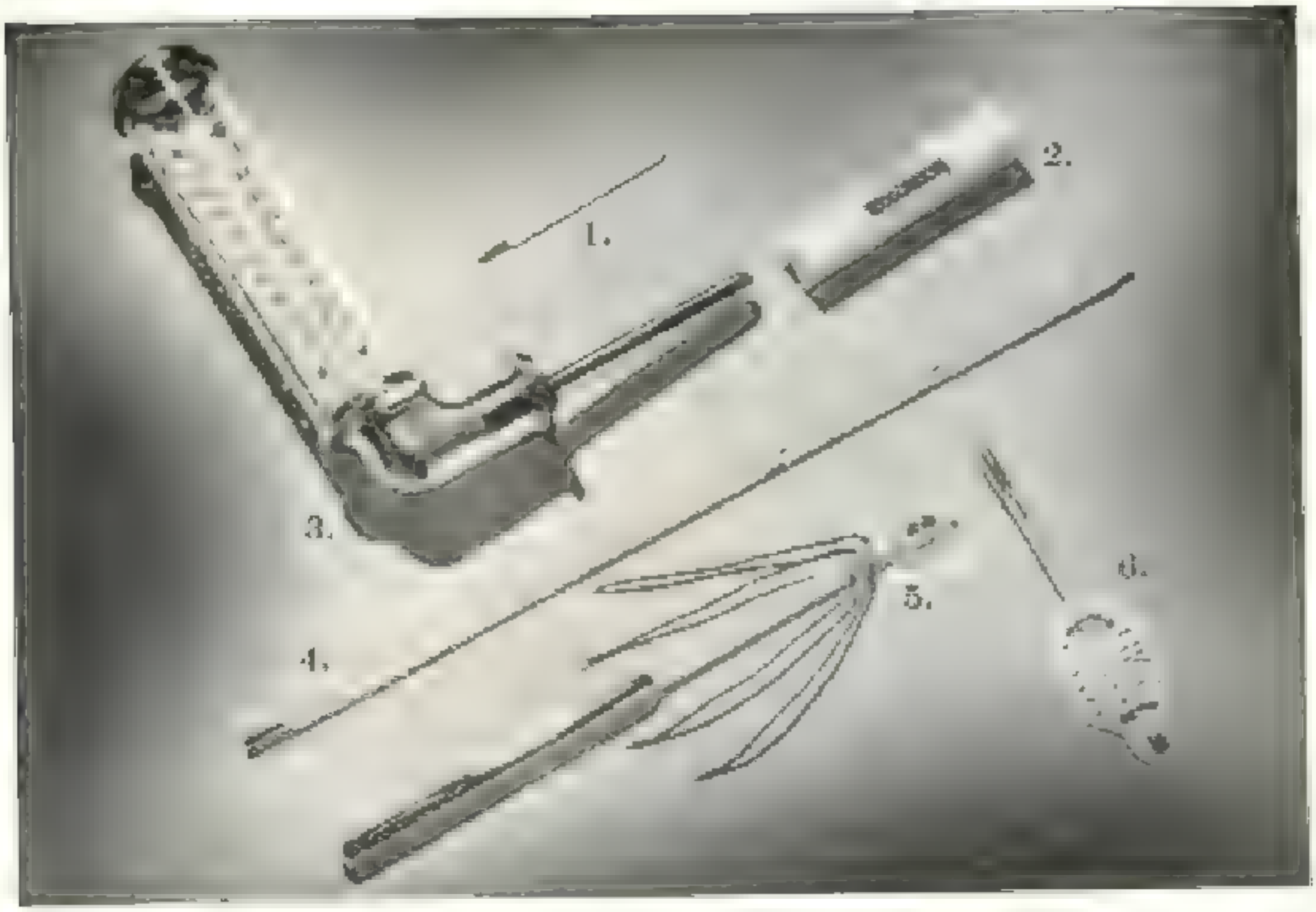
4. Every word's true! [illegible]

Product of General Foods

Sanka Coffee

[illegible]

Instant Sanka is the [illegible] instant coffee that's caffeine-free!



Which takes the temperature of a battleship?

The thermometer with wires [illegible]

It hangs in the powder magazine and long before [illegible] the temperature [illegible] gets [illegible] the [illegible] the tube [illegible] in [illegible] and [illegible]

The right angle thermometer [illegible] in the side of a [illegible] It tells women [illegible] the proper heat for [illegible] And the [illegible]

[illegible] model [illegible] model [illegible] temperatures without [illegible] powder. [illegible] thermometer [illegible] or [illegible] When [illegible] Lucy [illegible] up [illegible] "Mercury Blues" [illegible] out — [illegible]

An [illegible] thermometer [illegible] when [illegible]

These [illegible] of [illegible] hundred glass thermometers made from Corning [illegible] by Corning Glass Works.

[illegible] to a great extent [illegible]

[illegible] Making a [illegible] length of tubing [illegible] the [illegible] of [illegible] strength [illegible] and [illegible]

[illegible] thermometer tubing [illegible] of thousands of [illegible] but [illegible] resulted from [illegible] research to [illegible] the right kind of glass for the job, research to develop new [illegible] glass [illegible] and [illegible] process improvement.

If you are planning new products or processes it will pay you to call in Corning before you reach the drawing stage. Write to Corning Glass Works, Corning, New York.

CORNING
means research in glass

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[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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will like the quick interchangeability of the roll-film magazines . . . permitting the use of different film emulsions — color or black-and-white — in one camera.

SPORTSMEN

will thrill at the "reach" of the Telephoto Lenses that bring distant, inaccessible subjects into working range . . . thanks to rapid interchangeability of the lenses.

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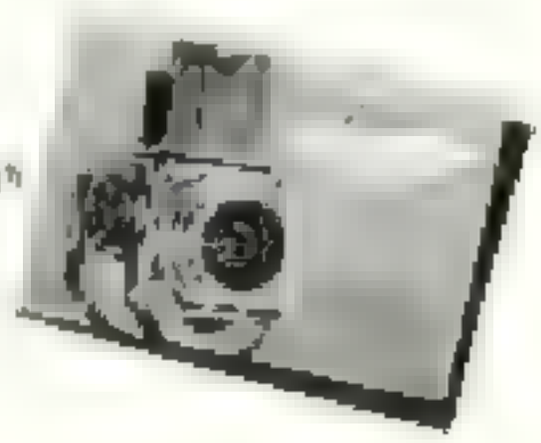

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[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

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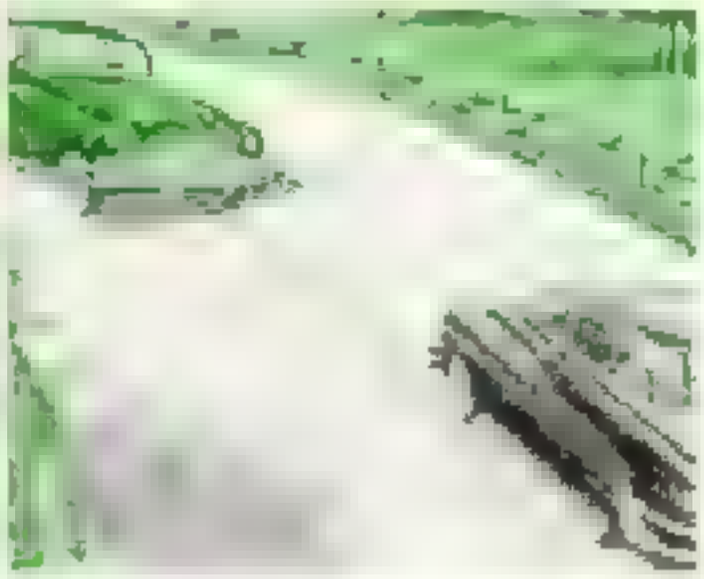

When motoring—

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With a feeling of [illegible] the recession for it [illegible] assigned the capabilities, the Budd Company is now pursuing [illegible] capabilities to include the manufacture of [illegible] products. We are still working [illegible] old customers in the transportation business, but among these developments will be parts for tank and personnel carriers and [illegible] Army truck [illegible] bodies, wheels, hubs and drives.

Certain things, however, need no [illegible]. These are the [illegible] from Budd employees [illegible] progress [illegible] translate these [illegible] The Budd Company's national [illegible] and making them [illegible]

THE BUDD COMPANY [illegible]

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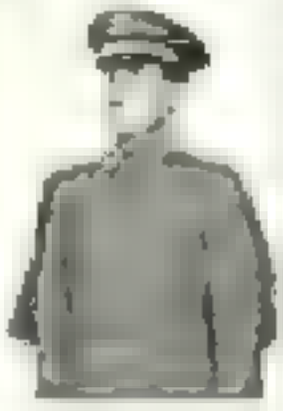

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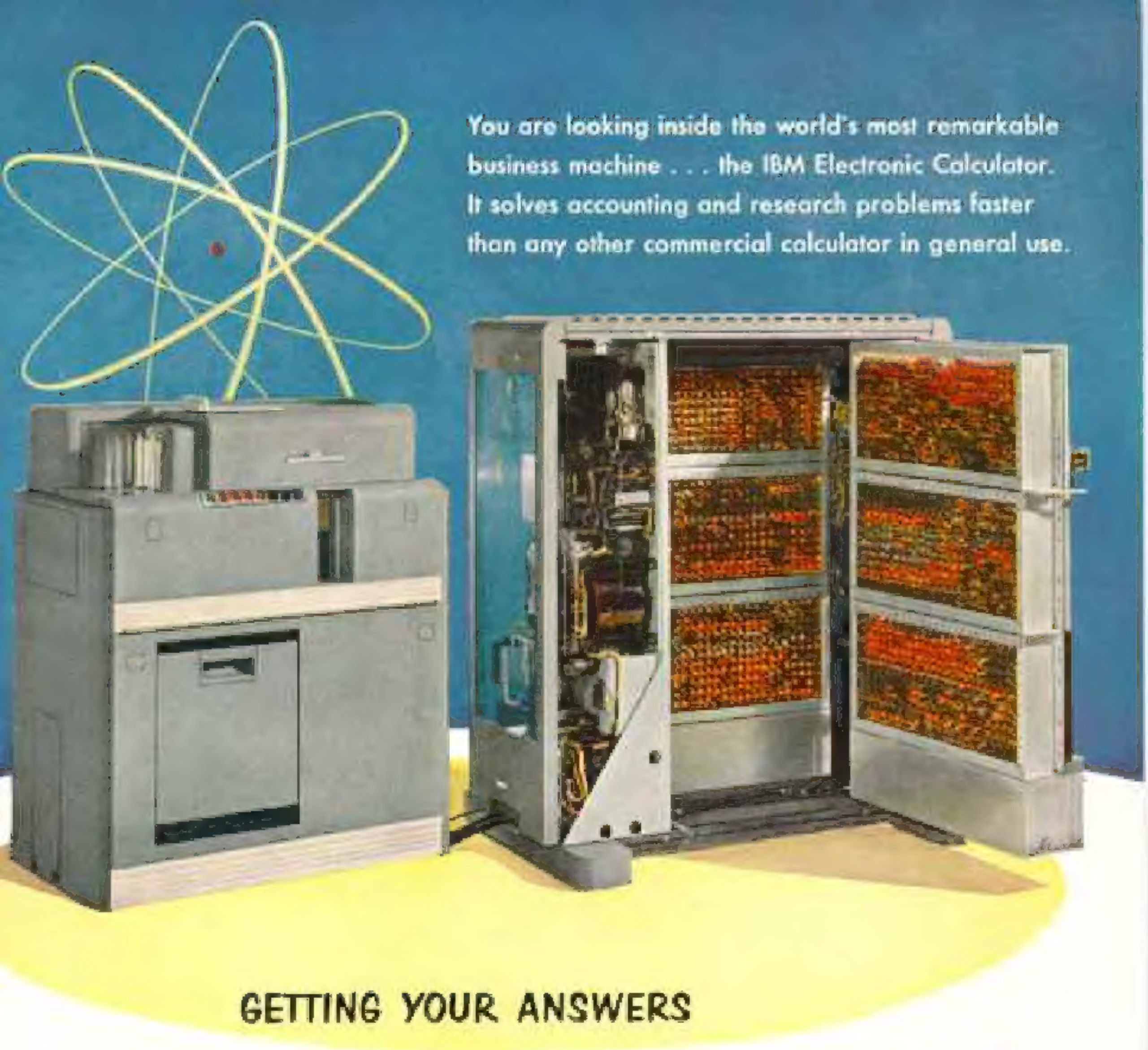

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